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Novell deal to tighten ties between hosts, PCs

By Margie Wylie
Senior Editor

NEW YORK — In a bid to fit PC users more tightly into the mainframe world, Memorex Telex Corp. — the second largest maker of mainframe peripherals after IBM — will announce here this week a plan to team with LAN leader Novell, Inc.

The pact will give Memorex Telex the right to resell a customized version of Novell's NetWare for SAA LAN-to-mainframe gateway software that will extend to personal computer users the standard capabilities they expect in an IBM mainframe environment, sources said.

The companies also plan to cooperate on support and training. Details about products the companies will codevelop over the longer term will emerge early next year.

Memorex Telex and Novell officials refused comment. But according to sources, Memorex Telex plans to unveil the 9430 Enter-

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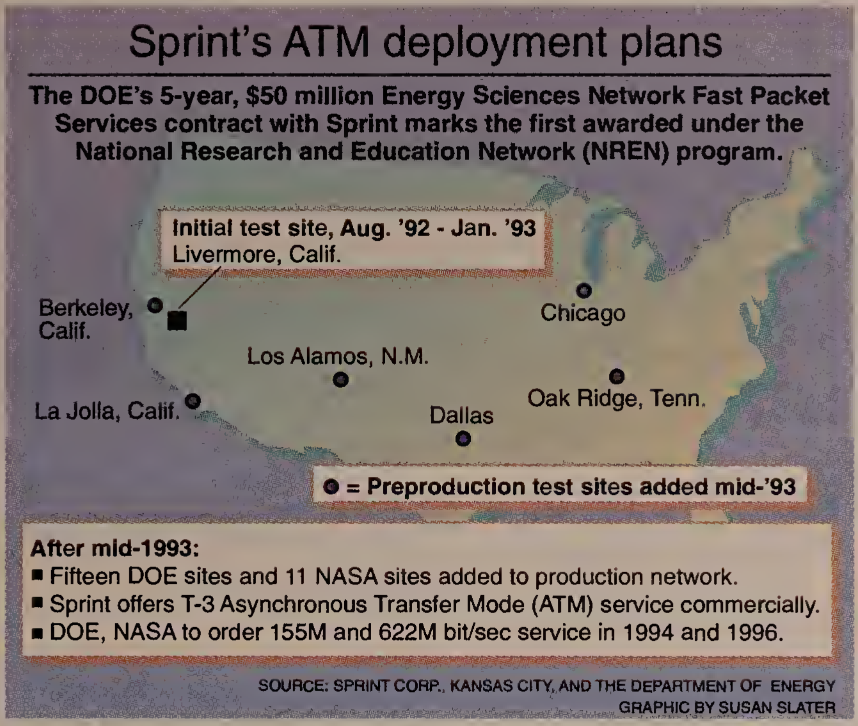
Sprint's ATM deployment plans

The DOE's 5-year, $50 million Energy Sciences Network Fast Packet Services contract with Sprint marks the first awarded under the National Research and Education Network (NREN) program.



After mid-1993:
- Fifteen DOE sites and 11 NASA sites added to production network.
- Sprint offers T-3 Asynchronous Transfer Mode (ATM) service commercially.
- DOE, NASA to order 155M and 622M bit/sec service in 1994 and 1996.

SOURCE: SPRINT CORP., KANSAS CITY, AND THE DEPARTMENT OF ENERGY
GRAPHIC BY SUSAN SLATER

First NREN award will vault Sprint to forefront of ATM

By Ellen Messmer
Washington Correspondent

LIVERMORE, Calif. — The Department of Energy (DOE) last week awarded a five-year, $50 million contract for high-speed public switched Asynchronous Transfer Mode (ATM) services to Sprint Corp.

The DOE service contract — the first awarded under the government's National Research and Education Network (NREN) program — will give Sprint the financial backing to accelerate its original ATM deployment schedule and roll out the service on a commercial basis in mid-1993.

Under the contract, Sprint will supply the DOE and National Aeronautics and Space Administration with ATM service at 45M bit/sec T-3 speeds based on a specification approved by the ATM Forum last March and now under final review by ANSI.

The DOE and NASA are expected to order 155M and 622M bit/sec ATM service — the CCITT standards for the more common ATM speeds — during the later

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NETLINE

EIGHT CARRIERS join forces to build pan-European switched digital net. Page 2.

HP TO OPEN UP proprietary E-mail system. Page 2.

PACK WILL MONITOR SNA traffic flowing between hosts and LANs. Page 4.

MAI SYSTEMS TO release financial applications for client/server environments. Page 4.

STRATACOM SOFTWARE improves efficiency of frame relay networks. Page 4.

CISCO'S FDDI interface supports both translational and transparent bridging. Page 4.

BELL ATLANTIC offers ISDN links to long-haul carrier nets. Page 5.

NEWSPAPER

IBM, Sears venture takes on the world

Advantis blends companies' net units, targets emerging global network outsourcing market.

By Michael Cooney
Senior Editor

NEW YORK — IBM and Sears, Roebuck and Co. last week joined forces in a venture analysts said is positioned to become one of the most powerful players in the global net outsourcing market.

The new company, Advantis, will consolidate IBM's and Sears' domestic and international value-added network (VAN) operations to provide voice and data transmission, outsourcing, electronic data interchange and network integration services for multinational corporations.

Observers said the venture promises to bring in millions of dollars in new network business for IBM. It will also provide strong competition for the other major players fighting to control the global network outsourcing business, including Sprint Corp. and British Telecommunications PLC, with its Syncordia Corp. unit.

"We want to let our customers do business all day, every day, on a worldwide scale," said Syd Heaton, chief executive officer of Advantis.

From Day One, Advantis will be a giant company. It will handle the internal networking needs of IBM and Sears while serving more than 9,000 customers with over one million users worldwide. Analysts expect Advantis to generate $1.1 billion of revenue in its first year of operation.

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FEATURES

- **Widening net lanes for bandwidth hogs. Page 39.**
- **Network innovator tackles social issues. Page 55.**

RBHC tariffs offer insights into the reality of SMDS

By Bob Wallace
Senior Editor

As the regional Bell holding companies file general tariffs for Switched Multimegabit Data Service (SMDS), early trends in service availability, pricing and network design are beginning to emerge.

Bell Atlantic Corp. and Pacific Telesis Group are the first two RBHCs to tariff SMDS. US West, Inc. will file a general tariff for SMDS sometime this week.

All three carriers will initially offer SMDS at 1.17M bit/sec. They will add 34M bit/sec and interim speeds as switch vendors upgrade their products to support those capabilities.

SMDS is a high-speed, packet-oriented digital data service that supports transmission at 1.17M bit/sec using T-1 access links and at 34M bit/sec using T-3 facilities. Local carriers have positioned SMDS as a service for local-area network interconnection, videoconferencing and

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NET muxes get frame relay tools

By Jim Duffy
Senior Editor

REDWOOD CITY, Calif. — Network Equipment Technologies, Inc. (NET) last week rolled out the first frame relay products for its statistical multiplexers and backbone switches.

NET also unwrapped new software for its LAN/WAN Exchange (LWX) router that supports frame relay, enhances communications among interconnected IBM Token-Ring LANs and boosts interoperability with other vendors' routers.

Among the frame relay announcements was new Frame Re-

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AST to roll out SMP 'open architecture' superserver

Provides high-end capabilities, supports SMP to distribute tasks evenly among its processors.

By Caryn Gillooly
Senior Editor

IRVINE, Calf. — AST Research, Inc. last week introduced a local-area network superserver designed to support symmetric multiprocessing (SMP).

The server, called the Manhattan SMP, is being touted by company executives as an "open architecture" superserver, providing high-end capabilities using standard hardware and software.

Like other superservers, the Mahattan SMP is designed to support several processors. It can be configured with up to four Intel Corp. i486 processors and, in the future, will be able to accommodate other types of microprocessors as well, although the company declined to be more specific.

Unlike many other superservers, however, the Manhattan SMP supports SMP to divvy up tasks evenly among its four processors.

AST said all of the system's CPUs can service any I/O peripheral or software interrupt.

This differs from asymmetric multiprocessing, in which each of the system's CPUs are assigned to a specific task.

"As you add CPUs, you get

(continued on page 7)

Pan-European switched digital service in the works

Eight carriers join to build transcontinental net.

By Bob Wallace
Senior Editor

Eight European carriers have joined forces to build a transcontinental network to provide users with a common set of switched digital services.

The network will be based on proprietary switches and enable the carriers to offer switched digital services until Integrated Services Digital Network reaches a critical mass in Europe.

The services, which will carry a different name in most countries, will be offered by Mercury Communications, Ltd. in the U.K. and the post, telegraph and telephone administrations in Belgium, Denmark, Finland, the Netherlands, Norway, Sweden and Switzerland.

"These will be the only switched digital services available across the continent," said Matt Christensen, a senior European research analyst with the the Global Network Strategies practice of the META Group, a Westport, Conn., consultancy.

Absent from the list of participants are France, Germany, Italy and Spain. PTTs in these countries are building the Global European Network (GEN), a fiber pan-

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HP to open E-mail to other mail systems, new clients

By Jim Duffy
Senior Editor

PALO ALTO, Calif. — HP last week said it will open up its proprietary DeskManager electronic mail system by providing links to non-HP messaging systems.

HP plans to add support for international and de facto standard messaging interfaces to DeskManager, enabling the mail system to support a variety of desktop clients and work with other public and private E-mail systems without gateways.

By the second half of 1993, HP plans to extend DeskManager with direct links to the leading personal computer local-area network-based E-mail systems, such as Lotus Development Corp.'s cc:Mail, and support for standard messaging transports such as X.400.

DeskManager already supports DOS and HP NewWave clients. But the company is looking to expand that support to Macintosh, Windows and Unix desktops by including the mail application program interfaces (API) those clients use in DeskManager.

Currently, there are a couple of mail APIs being promoted by vendors as standards. One is

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Briefs

Managing the desktop. The Desktop Management Task Force (DMTF) has settled on an architecture that will allow networked personal computers to be managed from a variety of vendors' applications. Announced last week, The Desktop Management Interface (DMI) architecture will offer two interfaces. A management interface will serve as a common link through which management applications can monitor and control PC software and hardware. A component interface will let vendors pass information or control of their applications, operating systems and hardware to DMI-compliant management applications. DMI will initially support the Simple Network Management Protocol and Common Management Over LLC.

DMTF members are Digital Equipment Corp., Hewlett-Packard Co., IBM, Intel Corp., Microsoft Corp., Novell, Inc., SunConnect and SynOptics Communications, Inc.

VINES goes OSI. Banyan Systems, Inc. last week said it will provide users of its VINES network operating system with Open Systems Interconnection support through a licensing agreement with Retix. Westborough, Mass.-based Banyan will offer new server-based options for its VINES for SCO Unix, including software for Virtual Terminal and File Transfer, Access and Management (FTAM) support, as well as local- and wide-area network transport. They are priced at $1,595, $1,595, $695 and $1,095, respectively, and are expected to be available in March of next year.

Reach for the StarGroup. NCR Corp. has begun shipping symmetric multiprocessing (SMP) capabilities for the most recent version of its StarGroup network operating system. The SMP feature of StarGroup LAN Manager 2.0 supports up to eight processors and 1,000 users on a single server. It runs on NCR's System 3000 and StarServer E platform. Multiprocessing support for StarGroup LAN Manager 2.0 costs from $2,995 to $3,495, depending on the number of processors.

Trio to offer retailers net services. JCPenney Company, Inc., Capital Cities/ABC and GTE Spacenet Corp. last week announced a joint venture that will provide a wide range of communications services for retailers. Advanced Retail Communications will offer television, audio and data services to major shopping malls and other retail sites from a network of terrestrial and satellite facilities. It will begin operations next year and use GTE Spacenet and JCPenney Communications satellite networks, as well as the retailer's terrestrial data net.

Get down. Robert Fabbio, founder and former president of Tivoli Systems, Inc., has formed a company to develop and market software and services to assist users in downsizing. Atrium Technologies is funded by brokerage houses, on-line information service suppliers and chemical firms. Atrium, which has more than $1.5 million in funding, is located in Austin, Texas.

BT wins outsourcing pact. BT last week announced a three-year global outsourcing agreement with BP Chemicals, Inc., the chemicals and plastics division of British Petroleum Company, plc. BT will use its Global Network Services as well as offerings and resources from its Syncordia Corp. global outsourcing subsidiary to serve BP Chemicals. Syncordia will provide a Managed Private Network Service to link 11 BP Chemicals sales offices, manufacturing and refinery sites located in seven European countries.

CONTACTS

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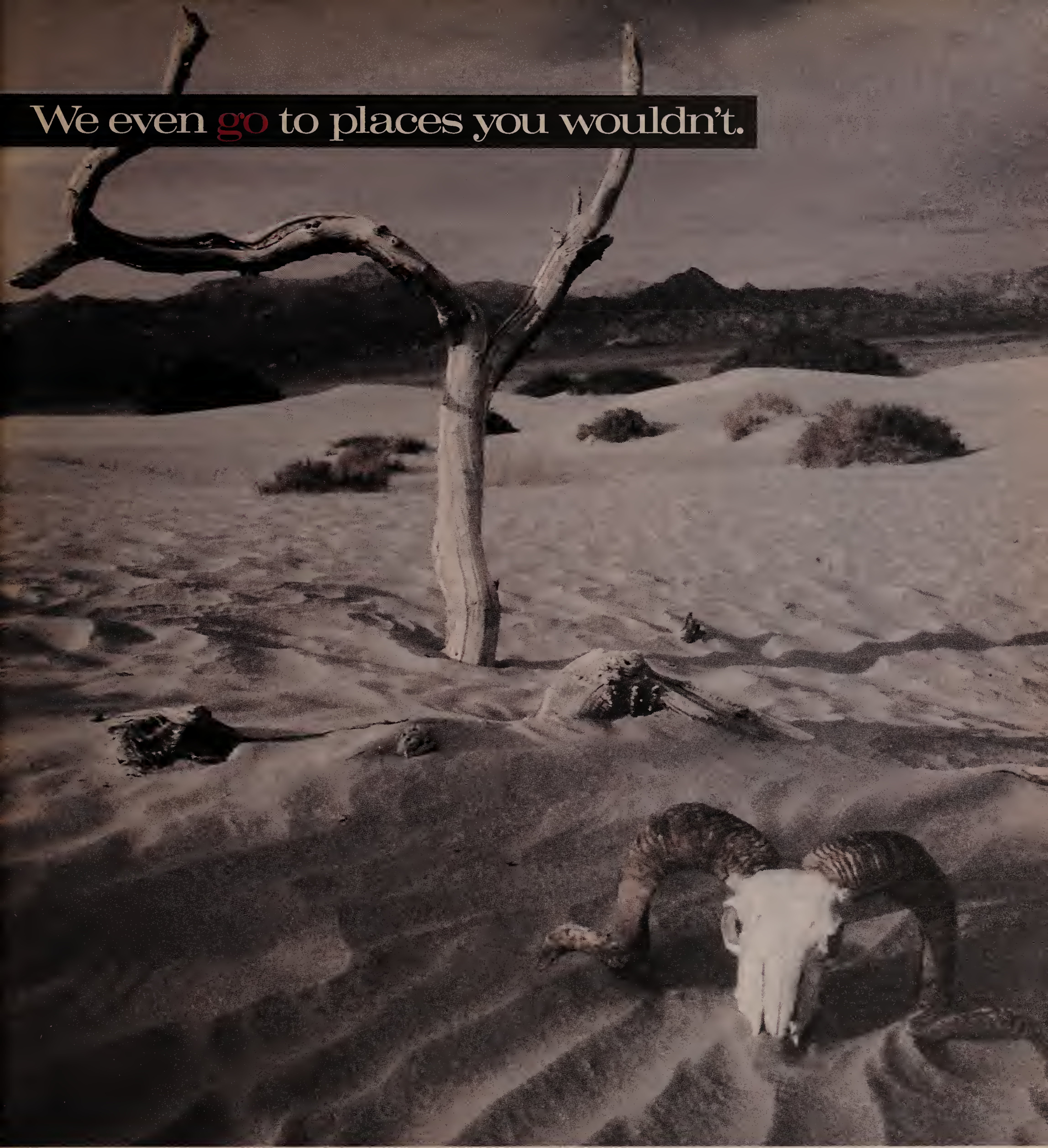

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SNA/LAN monitor checks real-time response times

Net-F/X(A-LAN) helps users resolve net problems.

By Michael Cooney
Senior Editor

AGOURA HILLS, Calif. — Network Telesis, Inc. is expected to introduce in September software that monitors network performance between LAN-connected devices and IBM Systems Network Architecture hosts.

Net-F/X(A-LAN) provides a variety of information, such as host response time, network performance levels and file-transfer time, about the communications between IBM hosts and token-ring and Ethernet servers and workstations. It also helps users resolve net problems.

The product has three components, including an application that runs under VTAM on a host, an agent that runs on a local-area network-attached OS/2 workstation and an OS/2-based console.

The product works by establishing a session between the workstation agent and the host. The workstation then sends user-specified test data, such as a transaction or file transfer, over the SNA net to the mainframe, where the VTAM piece measures and records response times. The resulting data is visible in graphic form on the console and can be stored for future use.

Users can adjust message lengths, file-transfer sizes, test intervals and traffic paths, and they can also measure performance of workstation-to-LAN server links. Net-F/X(A-LAN) is controlled by the master console and can operate automatically or by operator demand.

> "The product can run continuous response time tests for servers or segments of bridged LANs," Mahnke said.

▲▲▲

The OS/2 workstation agent runs as a background task under OS/2, said Roger Mahnke, vice-president of marketing for Network Telesis.

"The product can run continuous response time tests for servers or segments of bridged LANs," Mahnke said. "Alarms are triggered at the console when thresholds are exceeded."

Mahnke said Net-F/X(A-LAN) can pass the alarm information to NetView, IBM's host-based net management platform, so that a NetView operator can work to solve the problem. Data can also be written to host databases.

Mahnke said the product can be used to test the impact of a proposed application. It can also simulate the addition of terminals and workstations to the net.

The product differs from most LAN performance monitors in that it tracks the impact of LAN traffic on an SNA net and provides a real-time view of performance, not just historical reports, analysts said.

The Net-F/X(A-LAN) product is the first in a series of Net-F/X products to be rolled out in the next year or so. Net-F/X(SDLC) will measure response times for devices linked to the host via Synchronous Data Link Control lines. A product to measure X.25 net performance is also planned.

Net-F/X(A-LAN)'s VTAM portion and the console, which includes OS/2, will sell for $15,000. Each PC agent will cost an additional $1,250. A DOS version will also be available. ◼

StrataCom package boosts frame relay performance

By Jim Duffy
Senior Editor

CAMPBELL, Calif. — StrataCom, Inc. this week will unwrap software that can improve frame relay network efficiency by filling in gaps in available bandwidth and anticipating and preventing link congestion.

ForeSight software for StrataCom's IPX fast packet switches lets users burst data above the committed information rate (CIR) of each permanent virtual circuit (PVC) to take advantage of idle trunk bandwidth. The software also detects and avoids potential network congestion by monitoring trunk utilization and dynamically adjusting the information rate of each PVC.

Previously, StrataCom's Credit Manager software could predict network congestion and regulate the admission of frames but could not burst data above the CIR to fill up unused bandwidth on the trunk.

Now, if ForeSight detects unused capacity in a T-1 trunk, for example, it will let PVCs that are committed to 64K or 128K bit/sec transmissions burst beyond those rates to fill up the T-1 pipe.

ForeSight controls congestion by monitoring the amount of frames in PVC buffers without allowing the buffers to fill up. It works with Credit Manager, which regulates the conversion of frames into cells and loads the cells into the switch's trunk queue. StrataCom's IPX is a cell-based packet switch.

When the trunk queue approaches a 30-cell threshold, congestion alerts are triggered. ForeSight then initiates PVC frame admission and cell conversion adjustment procedures.

Other frame relay switches, StrataCom contends, do not monitor downstream traffic or buffer levels. As a result, they cannot control the rate at which frames are admitted to the network nor can they predict when congestion is about to occur. Therefore, they blindly allocate bandwidth and discard frames when traffic backs up, StrataCom said.

Discarded frames cause delays due to retransmissions.

StrataCom officials and analysts believe ForeSight may make frame relay a more viable data communications option for users and carriers.

"We really see this as a big advance, a maturation of frame relay services," said StrataCom Product Line Manager Bryan Long. "We see this increasing the flexibility of carriers to offer services tailored more to the characteristics of user applications."

Rob McKinney, manager of internetworking services for CompuServe, Inc. in Columbus, Ohio, said ForeSight offers users better utilization of access lines and carriers better utilization of trunks.

He said CompuServe plans to use ForeSight in its StrataCom-based frame relay net early next year.

Robbie Forkish, an independent telecommunications consultant in Eugene, Ore., said ForeSight could impact the way carriers price frame relay services. If they bill on a usage basis, carriers could charge users for trunk bandwidth used in burst mode, Forkish said.

Currently, users of StrataCom-based frame relay nets are billed either by usage or by CIR, Forkish said.

ForeSight will be available in the first quarter of 1993 at a price of $1,000. ◼

MAI Systems to offer first client/server financial pack

By Wayne Eckerson
Senior Editor

SAN FRANCISCO — MAI Systems Corp. will announce Wednesday the availability of an integrated set of financial applications that works in a client/server environment.

The announcement, which will be made at Digital Consulting, Inc.'s Downsizing Expo here, will make MAI Systems the first company to ship a client/server financial suite. PeopleSoft, Inc. announced a suite of client/server financial applications in April but is not expected to deliver it until the end of the year.

MAI Financial Solutions works with Sybase, Inc.'s SQL Server database server and was built using Sybase's fourth-generation language. The server portion of MAI Financial Solutions runs on Unix servers from IBM, Hewlett-Packard Co., Sun Microsystems, Inc. and NCR Corp., and the client part runs on Unix workstations, personal computers and X Window System or ASCII terminals.

By supporting a variety of client machines, MAI Financial Solutions allows companies to implement the software without replacing or upgrading existing desktop hardware, said Craig Bickley, general manager of the MAI Financial Solutions Business Unit in Novi, Mich.

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Cisco airs FDDI card for routers

By Maureen Molloy
Senior Writer

MENLO PARK, Calif. — Cisco Systems, Inc. announced last week a new FDDI module for its AGS+ bridge/router that supports translational and transparent bridging.

The Fiber Distributed Data Interface module can be used for a wider array of purposes than the vendor's existing FDDI card, which only supported encapsulation bridging for linking similar LANs, such as Ethernets, through an FDDI net. The new module will link FDDI LANs and let users on a non-FDDI network directly access devices on an FDDI network.

Encapsulating bridges wrap packets within a media-specific envelope and forward them to another bridge for delivery to the destination node.

In contrast, translational bridges convert Ethernet or token-ring packets into an FDDI format, enabling devices on those LANs to communicate directly with nodes on an FDDI ring.

Transparent bridging transports FDDI packets from one FDDI ring to another without encapsulation or translation.

As FDDI media proliferates in Digital Equipment Corp. networks, the new FDDI card will become particularly suitable for DEC VAX users. The card lets users directly attach VAX hosts to FDDI rings, rather than having to link them to an Ethernet that hangs off an FDDI backbone, as is required with encapsulation bridging.

With the new module, Ethernet-attached hosts or terminals running DEC's Local Area Transport can also communicate directly with hosts on an FDDI net.

The new card will provide improved performance in environments where users have chosen to bridge instead of route data.

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Bell Atlantic to link ISDN net to long haulers

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Bell Atlantic Corp. last week became the first RBHC to announce it can link its Integrated Services Digital Network with those of long-distance carriers.

That interconnection will be facilitated by a new service, dubbed 64 Clear Channel Capability, that lets the carrier establish clear channel switched links with long-haul carriers to support inter-local access and transport area transmission of 64K bit/sec ISDN channels.

Bell Atlantic will roll out 64 Clear Channel Capability first in portions of New Jersey and Delaware. Basic Rate Interface (BRI) customers in those areas whose long-distance providers utilize 64 Clear Channel Capability will be able for the first time to place long-distance ISDN calls. Currently, long-distance ISDN calls are possible only if customers can afford a T-1 line or have a Primary Rate Interface offering.

Bell Atlantic can offer the 64 Clear Channel Capability now because it has implemented Common Channel Signaling System 7 (CCS7). CCS7 allows Bell Atlantic to share out-of-band signaling data with long-haul carriers.

Until now, carriers have transmitted signaling data using 8K bit/sec capacity on a 64K bit/sec link, leaving only 56K bit/sec of bandwidth for user traffic. This was true for local service, as well as the handoff of local calls to the long-distance network.

Initially, BRI users will be able to place long-haul ISDN calls only within Bell Atlantic's service area. But once other regional Bell holding companies roll out similar services, BRI users will be able to call any other ISDN user in the country.

Bell Atlantic's new offering complies with the emerging National ISDN 1 standard, a nationwide implementation of ISDN agreed to by carriers and manufacturers. It isn't clear whether other carriers interconnecting with Bell Atlantic's ISDN network will need switches compliant with National ISDN 1.

Better quality

John Rudden, manager of switched access product management at Bell Atlantic, said he expects the new capability will benefit not only ISDN customers, but will enhance transmission quality for other types of calls, particularly videoconferencing.

"Some of the video applications that are going to be coming down the pike require 64 Clear Channel," Rudden said.

The 64 Clear Channel Capability will be available to any customer purchasing Feature Group D or trunkside 10XXX access — typically long-distance carriers. However, if a large user is currently purchasing either of those options and has an SS7 network, the user can upgrade to the 64 Clear Channel Capability for free.

Rudden said the carrier sees the new offering as an enhancement to its existing access offerings and hopes it will boost sales of ISDN.

"The more interconnectivity we have, the more valuable [ISDN] will be, and that's going to stimulate additional penetration in the market," Rudden said.

Bell Atlantic plans to continue rolling out the 64 Clear Channel Capability, most likely making it available in Philadelphia, Pittsburgh and Baltimore by the first quarter of 1993, Rudden said.

Service should be up and running in New Jersey and Delaware before the end of the year. ☑

Novell deal to tighten host, PC ties

continued from page 1

prise Gateway, essentially Novell's NetWare for SAA gateway software with Memorex Telex-developed NetWare Loadable Modules (NLM).

The software will come loaded on a monitorless PC based on an IBM Micro Channel Architecture. It will sport a special high-speed interface to the new line of superservers announced by Memorex Telex in conjunction with Tricord Systems, Inc. last week.

"The changes [to Novell's gateway] will ease migration for Memorex Telex's customer base [to PC local-area network environments]," said Cindy Santisario, senior analyst with International Data Corp. (IDC) based in Framingham, Mass. The NLMs will enable the gateway to be channel-attached to IBM hosts, provide NetView support and let PCs support terminal emulation over Transmission Control Protocol/Internet Protocol links, according to sources.

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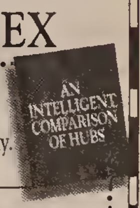

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AST to roll out SMP superserver

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nearly linear performance improvement with fully symmetric multiprocessing," said Michael Kreiger, director of advanced systems marketing at AST, based here. "In asymmetric design, bottlenecks may occur because only one processor can handle the I/O interrupts."

Many other companies, such as Compaq Computer Corp., offer servers with multiple Intel processors, but a majority of these machines provide asymmetric multiprocessing capabilities. Today's SMP machines are typically based on Reduced Instruction Set Computing processors because most SMP applications are designed to run in a Unix environment.

Although there are not yet many applications — and even fewer network operating systems — that can take advantage of SMP, analysts predict that as more hardware vendors come out with SMP-capable machines, software vendors will follow suit and release SMP-based applications.

As evidence of this, The Santa Cruz Operation, Inc. (SCO) last week demonstrated its new SCO MPX 2.0 Unix-based operating system running on AST's new machine. SCO said SCO MPX takes advantage of SMP hardware.

In addition to SCO MPX 2.0, the Manhattan SMP supports Novell, Inc. NetWare networks running on top of IBM's OS/2 and the SCO version of Banyan Systems, Inc. VINES. AST is working with IBM to add support for LAN Server, and the firm plans to support Microsoft Corp.'s LAN Manager as soon as Windows NT is available.

Also unlike many of today's high-end servers, the Manhattan SMP accommodates Industry Standard Architecture (ISA) and Extended ISA cards as well as EISA Small Computer System Interface (SCSI) adapters, as opposed to proprietary hardware.

"We use standard SCSI disk drives, we put the [error-correcting] memory on the adapter card so customers can buy memory from any vendor, and we use an EISA bus for I/O peripherals so customers can use any vendor's EISA board," Kreiger said. "We also support a world of shrink-wrapped software."

The system comes with 16M bytes of error-correcting memory, expandable to 256M bytes; support for Redundant Array of Inexpensive Disks (RAID) Levels 0, 1 and 5; 10 expansion slots; 16 SCSI disk drives and a 64-bit system bus.

Analysts agreed that the Manhattan SMP is not only a sound machine, but is also coming at the right time into a market that is just beginning to emerge.

"They've done a good job with this release. I think this is a leading-edge machine," said Norton Greenfeld, analyst at Computer Intelligence/InfoCorp, a research and consulting firm based in La Jolla, Calif.

The Manhattan SMP is expected to be available by the end of this year, with prices starting at about $27,000. ◘

HP to open E-mail to other mail systems

continued from page 2

the Vendor Independent Messaging (VIM) API, which is endorsed by Apple Computer, Inc., Borland International, Inc., HP's Unix developers, Lotus and Novell, Inc. VIM is intended to provide a single API to which software developers can write mail-enabled applications.

Another is Microsoft's Messaging Application Programming Interface (MAPI). MAPI was originally conceived to allow software developers to build mail-enabled applications for Windows clients. But Microsoft said it wants to support DOS, Macintosh and OS/2 clients with MAPI, as well.

In addition, the X.400 API Association, a consortium of E-mail vendors, recently agreed to develop a standard mail API.

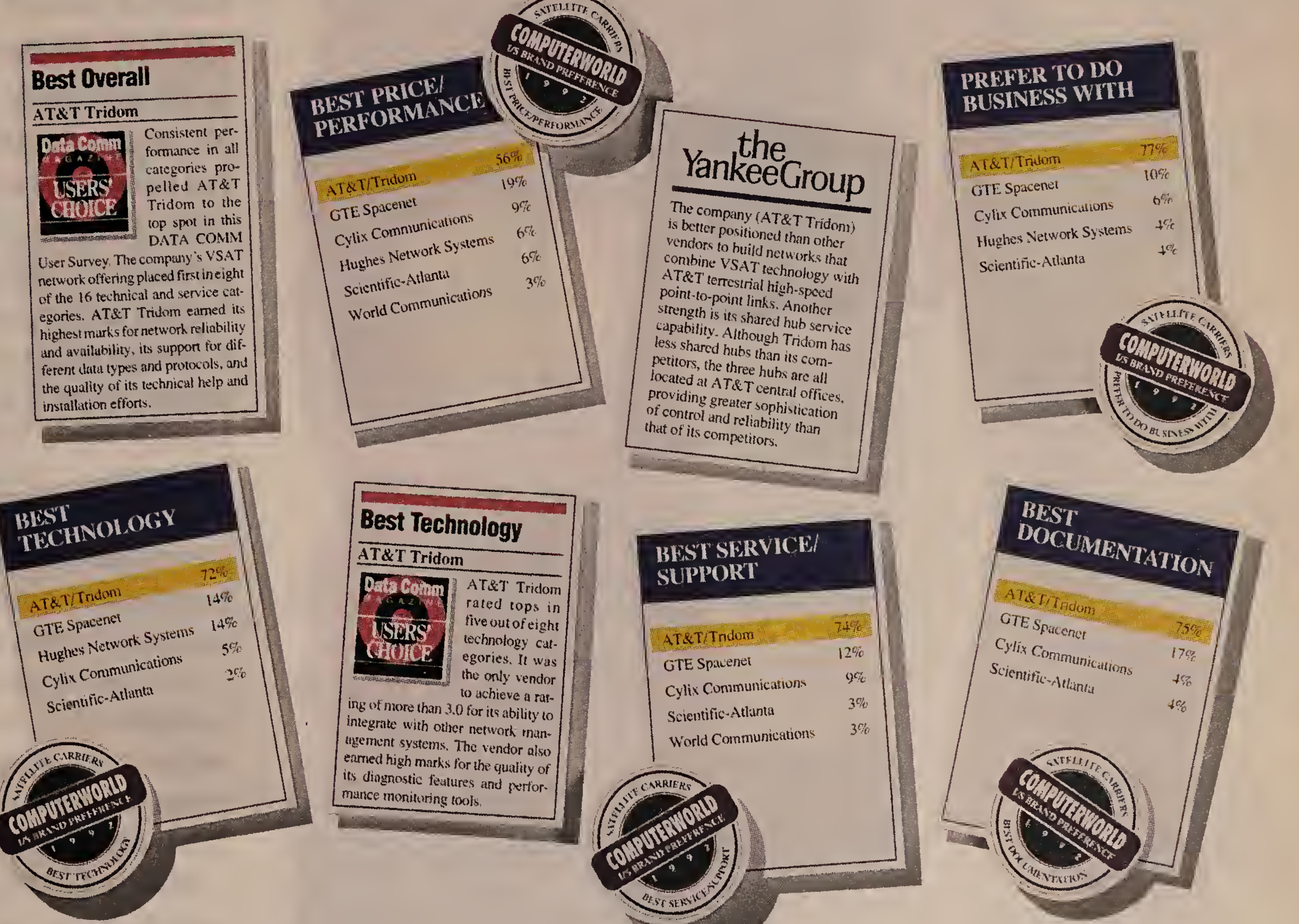
Paul Morgan-Witts, DeskManager product manager for HP, would not confirm which APIs DeskManager will support, except to say that DeskManager will support interfaces "similar" to those supported in HP's OpenMail messaging system.

HP has already pledged support for VIM and MAPI in OpenMail, which runs on Unix-based HP 9000 systems and supports X.400 and the Simple Mail Transfer Protocol.

Morgan-Witts said DeskManager's X.400 support will allow users to exchange messages with users of other X.400-compliant systems, including OpenMail, without a gateway.

Lab Safety Supply, Inc., in Janesville, Wis., currently uses a gateway to link cc:Mail clients to the HP messaging backbone. A direct connection between cc:Mail and DeskManager may provide faster message transfer and more functionality, said John Alexander, manager of Lab Safety Supply's data center. ◘

What are VSAT users saying about AT&T Tridom?



Best Overall

AT&T Tridom

Consistent performance in all categories propelled AT&T Tridom to the top spot in this DATA COMM User Survey. The company's VSAT network offering placed first in eight of the 16 technical and service categories. AT&T Tridom earned its highest marks for network reliability and availability, its support for different data types and protocols, and the quality of its technical help and installation efforts.

BEST PRICE/ PERFORMANCE	
AT&T/Tridom	56%
GTE Spacenet	19%
Cylix Communications	9%
Hughes Network Systems	6%
Scientific-Atlanta	6%
World Communications	3%

the YankeeGroup

The company (AT&T Tridom) is better positioned than other vendors to build networks that combine VSAT technology with AT&T terrestrial high-speed point-to-point links. Another strength is its shared hub service capability. Although Tridom has less shared hubs than its competitors, the three hubs are all located at AT&T central offices, providing greater sophistication of control and reliability than that of its competitors.

PREFER TO DO BUSINESS WITH	
AT&T/Tridom	77%
GTE Spacenet	10%
Cylix Communications	6%
Hughes Network Systems	4%
Scientific-Atlanta	4%

BEST TECHNOLOGY	
AT&T/Tridom	72%
GTE Spacenet	14%
Hughes Network Systems	14%
Cylix Communications	5%
Scientific-Atlanta	2%

Best Technology

AT&T Tridom

AT&T Tridom rated tops in five out of eight technology categories. It was the only vendor to achieve a rating of more than 3.0 for its ability to integrate with other network management systems. The vendor also earned high marks for the quality of its diagnostic features and performance monitoring tools.

BEST SERVICE/ SUPPORT	
AT&T/Tridom	74%
GTE Spacenet	12%
Cylix Communications	9%
Scientific-Atlanta	3%
World Communications	3%

BEST DOCUMENTATION	
AT&T/Tridom	75%
GTE Spacenet	17%
Cylix Communications	4%
Scientific-Atlanta	4%

At AT&T Tridom, there is nothing more important than standing by our customers — and it shows.

It shows in the 1992 *I/S Brand Preference* survey on wide area networks conducted by *Computerworld* where AT&T Tridom swept five categories including *Best Technology, Best Price/Performance, Best Service/Support, Best Documentation,* and *Prefer to Do Business With.*

It shows in the 1992 *Users' Choice* survey conducted by *Data Communications* in which AT&T Tridom was voted the *Best Overall VSAT Vendor* with the *Best Technology.*

And it shows by what industry analysts are saying. A recent *Yankee Group* report lauded AT&T Tridom's shared hub service capability, technical superiority, and facility for combining VSAT technology with terrestrial data services.

These achievements have occurred for one simple reason: *We make it our business to be totally responsive to our customers' networking needs.*

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AT&T Tridom

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3:15 P.M.

in Bahrain. We need an updated bid,

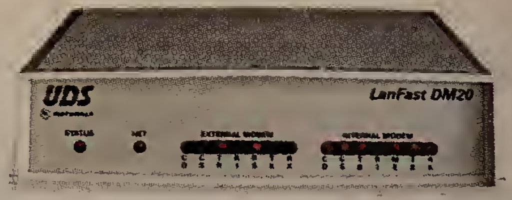
and Arthur's 9000 miles from the resources he needs to revise our quotation. Fortunately, he has access to the home office LAN, where there's a UDS LanFast™ network modem in residence. As soon as he can get to a phone, Arthur will use his regular modem to dial into the LanFast. The Novell LAN will see Arthur as just another node, with access to files, applications, peripherals—every LAN resource he needs.

UDS LanFast products are LAN-resident dial-in/dial-out devices with a built-in V.32 bis/V.42 bis modem and an integral LAN adapter card. They support thick, thin or 10BaseT Ethernet or Token-Ring. Three levels of security deny access to unauthorized users, and a second high-speed serial port extends network reach by accommodating an external modem or high-speed digital device.

LanFast is shipped with all necessary hardware and software. It supports standard modems at speeds to 57.6 kbps and popular communications programs such as Procomm Plus Network and Crosstalk Mk. IV.

Take care of your LAN "orphans" by adding LanFast to your network now. For full details, contact UDS at:

800/451-2369



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Circle Reader Service #121

Free Information for Readers of NETWORK WORLD

NETWORK WORLD

LEAD SERVICE

Issue date August 24, 1992

Card must be received by December 15, 1992

Name

Title

Company

Street

City

State Zip

Phone Fax

☐ **URGENT**

1. Action requested
- 1 ☐ Request for sales call
- 2 ☐ Request for proposal
- 3 ☐ Request for information

2. Purchase timeframe
- 4 ☐ Within 60 days
- 5 ☐ Within six months
- 6 ☐ Within one year

3. Scope of purchase responsibility
- 7 ☐ Enterprise wide
- 8 ☐ Departmental

4. Purchase influence/number of sites
- 9 ☐ One site
- 10 ☐ 2-9 sites
- 11 ☐ 10-20 sites
- 12 ☐ 21+ sites

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115
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NETWORK WORLD

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DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

Worth Noting

"IBM was both forthcoming and receptive to an unprecedented degree. Both are critical for the success of the new SNA. It's nice to see IBM using TLC instead of FUD."

Louise Herndon Wells
Editor of "SNA Perspective"
San Jose, Calif.
Discussing IBM's recent
APPC/APPN developers conference

Data Packets

Telepartner International of Farmington, Conn., last week rolled out an IBM 3270 terminal emulation program that runs under Microsoft Corp. Windows. Packet/3270 for Windows is based on Eicon Technology Corp.'s Access for Windows product, which is a 3270 terminal and printer emulator for Windows 3.X environments.

Packet/3270 allows users to access IBM mainframes via either X.25 packet networks or dial-up lines.

Packet/3270 for Windows is priced from $165 to $295, depending on quantity, and is available now.

Phoenix-based **AG Communications Systems** last week unwrapped software that audits and corrects system file organization in multinode Hewlett-Packard Co. Apollo Division workstation networks.

Node Audit monitors the software and system data contents of the nodes and ensures that they conform to a particular configuration, such as having the appropriate software release and file content. Node Audit runs on Apollo workstations and is available now for a base price of $7,000. ◘

Vendor adds SNMP support to Accumaster Integrator

Translator widens net view of AT&T mgmt. tool.

By Michael Cooney
Senior Editor

MOUNTAIN LAKES, N.J. — Users of AT&T's Accumaster Integrator network management system can now manage SNMP devices with new software from system integrator Unified System Solutions, Inc. (USS).

The company's Network Management Translator (NMT), announced last week, runs on a SunConnect SunNet Manager platform and translates Simple Network Management Protocol alerts, such as link or router failures, into alarms the Integrator can understand. Net operators can issue commands back to or call for service for the malfunctioning device.

The Integrator cannot directly monitor SNMP-based devices, such as bridges, hubs and routers, a fact which severely limits its role as a true enterprise manager, analysts said. The Integrator has been used to monitor private branch exchanges, modems and multiplexers.

NMT works by implementing the Integrator's Alarm Interface on the SunNet Manager platform, then translating and exchanging net management alerts directly with the AT&T platform, said Steve Morgenthal, vice-president of network technology for USS.

The SunNet Manager is linked to the Integrator through either a remote 9.6K bit/sec line or a local link. It supports the same SNMP Management Information Bases (MIB) the SunNet Manager does, which includes MIB I and II, plus many proprietary MIBs from vendors such as Cisco Systems, Inc. There is no limit to the amount of SNMP devices the platform can monitor, Morgenthal said.

NMT runs with SunNet Manager Version 1.2 or above, and can be ported to run on Hewlett Packard Co.'s OpenView management platform if those users want an interface to the Integrator, he said.

"NMT will let Accumaster users manage their entire net, not just part of it," Morgenthal said. "SNMP support is a feature that Accumaster customers have been looking for for a long time."

Analysts said the NMT soft-

(continued on page 10)

Product enables SNA to distribute Unix updates

By Michael Cooney
Senior Editor

ANN ARBOR, Mich. — IBM mainframes can now electronically distribute software updates to remote Unix users using new software from Cleo Communications.

The software, NetView DM Client, runs on Unix clients emulating a 3270 terminal and communicates with mainframe-based IBM NetView Distribution Manager (DM), letting users distribute files or software updates to Unix clients.

Although IBM's mainframe-based NetView DM lets users centrally control and distribute software and files over a Systems Network Architecture net, copies of Unix software must be mailed or hand-delivered.

NetView DM Client runs on 80386 or 80486 personal computers running Unix System V Release 3.2 and above from AT&T and others, and requires use of Cleo's 3270Linkix or 3770Linkix terminal emulation software. The software must reside on every Unix box the user wants updated by the NetView DM host. No software changes are required at the mainframe level.

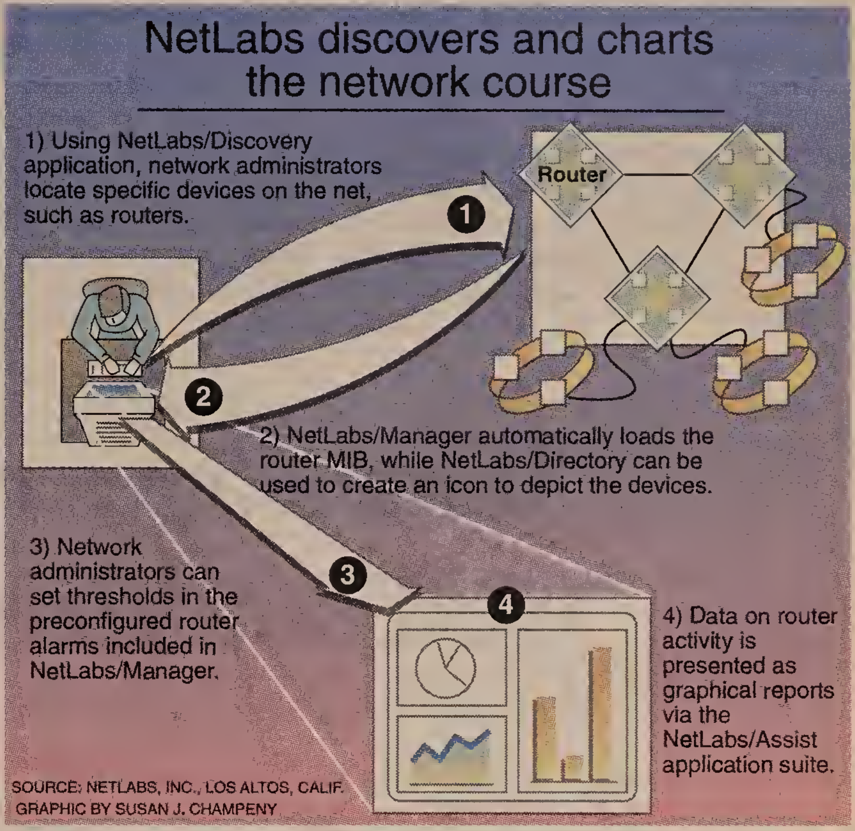
The client software lets users create files on the Unix box for transfer to the host and accept data from the host to files on the Unix system, and lets the host delete files on the Unix system.

"Once the DM client has been started, it requires no further attention from the operator," said Richard Sheridan, director of advanced product development at Cleo. "This can be a completely unattended operation."

NetView DM Client carries out

(continued on page 10)

NetLabs discovers and charts the network course



1) Using NetLabs/Discovery application, network administrators locate specific devices on the net, such as routers.

2) NetLabs/Manager automatically loads the router MIB, while NetLabs/Directory can be used to create an icon to depict the devices.

3) Network administrators can set thresholds in the preconfigured router alarms included in NetLabs/Manager.

4) Data on router activity is presented as graphical reports via the NetLabs/Assist application suite.

SOURCE: NETLABS, INC., LOS ALTOS, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

NetLabs enhances net management pack

Upgrades allow users to employ preconfigured alarms and search for specific product types.

By Jim Duffy
Senior Editor

LOS ALTOS, Calif. — NetLabs, Inc. last week enhanced its network management software to ease device location, configuration and problem resolution.

The company upgraded its NetLabs/Manager platform and NetLabs/Discovery mapping application and unveiled new management applications that, among other features, allow users to route information to appropriate specialists.

The software runs on Unix workstations with a Motif graphical user interface and manages devices in Transmission Control Protocol/Internet Protocol networks that support the Simple Network Management Protocol or Common Management Information Protocol over TCP/IP.

NetLabs/Manager, the base component of the management software suite, now comes with preconfigured alarms and offers improved access to Management Information Bases (MIB).

Rather than configuring alarms from scratch, users can now employ alarms that have been preconfigured for specific devices.

The alarms can be used as is or modified by changing things such as threshold values to suit particular needs, NetLabs said.

NetLabs/Manager's new MIB integration tool automatically creates tables of MIB variables for all networked devices. These tables, stored in the NetLabs/Manager's database, allow network managers to scan the attributes of network devices to facilitate management. Previously, users had to compile these tables manually.

The enhancements to NetLabs/Discovery, which automatically locates devices on the network, will enable users to search for specific device types, such as routers or workstations. Previously, NetLabs/Discovery only located devices that were either MIB I- or MIB II-compliant.

Also, users can select a subset of discovered devices to paste into a map topology. Previously, users could only paste one device at a time or all devices at once. And NetLabs/Discovery now automatically represents the network topology on the management station map instead of forcing the administrator to manually "draw" the configuration. Users can customize their own icons to identify specific device types.

The company also added three new management applications that are designed to generate

(continued on page 10)

NetLabs enhances net mgmt. pack

continued from page 9

concise summaries of network activity, create graphical displays and distribute service requests to qualified personnel based on network alerts.

The applications, collectively called NetLabs/Assist, run on the NetLabs/Manager platform. They include MetaView, for report and graph generation; Action Router, for sending alerts on a specific device to a specialist; and Alarm Starter Kit, which is a set of preconfigured alarms for specific devices.

MetaView presents data from alarm log files in either a line graph, bar graph or pie chart on the manager's screen. The manager can generate tables or graphs on traffic statistics, such as packet rates and collisions, and compare data across multiple nodes to reroute traffic or take other action. Users can specify which nodes, objects, attributes or alarms to include in the reports, the time period to be covered and whether the report should be displayed graphically or printed.

Action Router allows managers to dispatch service requests in response to problems detected upon receipt of alarms. Managers can specify routing based on time of day, type and location of device and the severity of the problem.

The Alarm Starter Kit is comprised of pre-configured alarms that provide fault and performance management for a variety of network devices. Like the preconfigured alarms in NetLabs/Manager, the Alarm Starter Kits save NetLabs/Manager users from configuring alarms from scratch.

Users greeted the new NetLabs software with tempered enthusiasm.

"It's just another release," said Dana Dawson, senior network analyst at Cray Research, Inc. in Minneapolis. "It won't drastically change the way I use their software. There's nothing that would paralyze me if I had to fall back to [a previous release]."

John Zweibel, network manager for programmable aerospace ground equipment at Martin Marietta Corp.'s astronautics group in Denver, said NetLabs/Discovery's capability to locate and represent network segments and devices lacks intuition. He said some of the IBM RISC System/6000s in his network are showing up as routers on the management console's map.

He added, however, that the RS/6000s are forwarding IP traffic that could have spoofed the software into thinking they are routers.

NetLabs/Discovery is priced at $3,000. NetLabs/Manager is priced at $12,500 for a network with more than 100 nodes and $5,000 for a network with 100 or fewer nodes. NetLabs/Assist is priced at $4,000. All products are available now. ◘

Vendor adds SNMP support to Integrator

continued from page 9

ware fills a significant gap in AT&T's net management offering, especially as SNMP becomes the de facto way to manage growing Transmission Control Protocol/Internet Protocol nets.

The application is also backed by Synoptics Communications, Inc. Morgenthal hinted that other platforms may support the software in the future but provided no additional details.

"This application is valuable to users because it ties LAN management platforms with an enterprise management system," said Tom Wood, an analyst with the Business Research Group, a Newton, Mass.-based consultancy. "Getting network management systems to work together is one of the most pressing needs users face."

The software is available now, but pricing has not been set. ◘

Product allows SNA to distribute updates

continued from page 9

commands from the host, displaying their progress through on-screen messages. These messages can also be stored at the client station for reports that can be created later.

Line speeds of up to 19.2K bit/sec are supported by the software.

"The NetView DM Client software lets users utilize their existing SNA network to do software updates to any Unix machines linked to the network without disrupting their current configurations," Sheridan said. "One of the biggest applications this software has is letting auto or pharmacy stores centrally distribute price changes and gather inventory information from remote stores overnight."

NetView DM Client software is available for $500. 3270Linkix and 3770Linkix are available for $1,995 each. ◘

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LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

Worth Noting

"Novell has classically said, 'Come one, come all' to third-party developers. It's not unusual that Novell would invite someone to make a product that overlaps its own."

Neal Hill
Analyst
Forrester Research, Inc.
Cambridge, Mass.
On Computer Associates
International, Inc.'s
Unicenter for NetWare

Netnotes

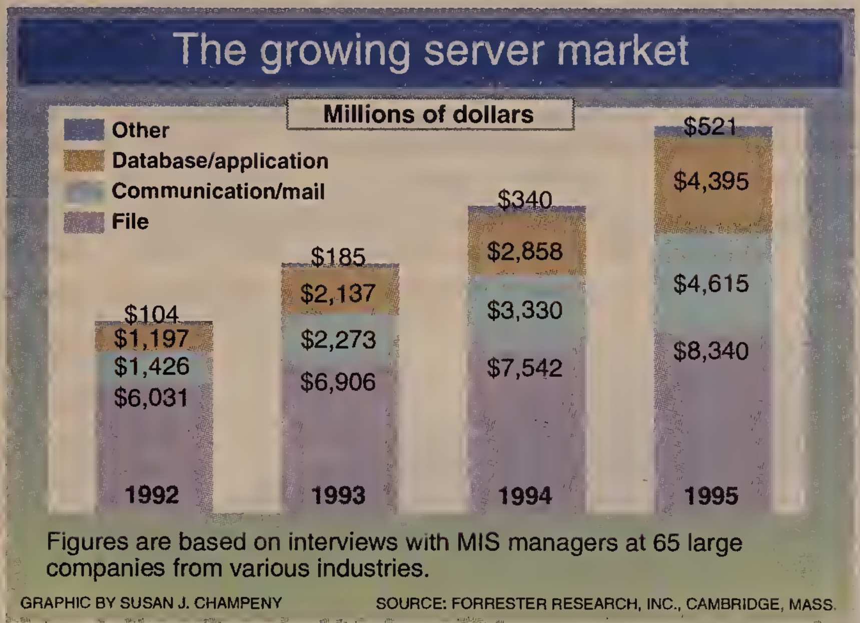
Macintosh net managers got a less expensive option for keeping applications and configurations up to date recently when **Apple Computer, Inc.** introduced its Likewise software. The $129 package lets managers update files and set configurations on an unlimited number of Macintoshes over an AppleTalk network.

The package consists of a client and an administration application. In order to be updated by the administration application, users must either start up from a special Likewise floppy diskette — rather than booting from their usual start-up disk — or they must copy the Likewise program to their usual start-up disk and run it from there.

The client lets a manager replace files and applications with new ones or configure the Macintosh with standard settings.

The software can also alter the user name and shut down the targeted Macintosh after an update is completed. When the start-up takes place from the special client diskette, a manager can erase the user's entire hard disk and replace the System Folder, the folder that contains the Macintosh's

(continued on page 12)



Figures are based on interviews with MIS managers at 65 large companies from various industries.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

DCA adds NetWare for SAA support to PC-to-host tools

Also offers terminal emulation over TCP/IP links.

By Caryn Gillooly
Senior Editor

ALPHARETTA, Ga. — Digital Communications Associates, Inc. has come into the Novell, Inc. NetWare world.

Last week, the terminal-emulation company announced that its entire micro-to-mainframe connectivity product line now supports Novell's NetWare for SAA, enabling customers to use Novell's gateway to access IBM mainframes.

This means DCA's Irma WorkStation for Windows, Irma WorkStation for DOS and Irma WorkStation for Macintosh can all reside on NetWare clients and use NetWare for SAA to tap into information on hosts.

Before this release, the Irma WorkStation products could only use DCA's own gateways to access host information. Since they were not compatible with NetWare, the DCA gateways had to reside on a separate server.

Because NetWare for SAA is a NetWare Loadable Module (NLM) that resides on the server, the need for a separate gateway server is eliminated.

Options abound

"Users now have a variety of gateway options," said Bob McGowan, workstation marketing manager at DCA, based here. "They can use the IrmaLink/EP gateway in DOS environments, the Select Communication Server for [Microsoft Corp.] LAN Manager environments and now NetWare for SAA in NetWare environments."

In conjunction with the NetWare for SAA announcement, DCA announced support for TN3270, which basically lets customers establish terminal-emulation sessions over a Transmission Control Protocol/Internet Protocol connection.

For example, Irma WorkStation users can now establish a host session over an Ethernet backbone running TCP/IP, as opposed to having to establish that session over a Systems Network Architecture backbone, which was previously required.

Mainframe links

"We recognize that more and more companies are implementing a variety of network backbones, and we also recognize that a lot of those companies are using TCP/IP to connect them all," McGowan said. "So users will now be able to connect to mainframes as well as other systems on the corporate network using TCP/IP."

According to DCA, NetWare for SAA support is expected to be included in the company's three workstation products by the end of this year. TCP/IP support will be included in its DOS and Microsoft Windows products within the same time frame.

Irma WorkStation for DOS and Irma WorkStation for Macintosh cost $425 each; Irma WorkStation for Windows costs $495. Customers who buy these products now can upgrade free of charge for 60 days following the first shipments of the enhancements. ◆

CA, Novell discuss Unicenter strategy

Questions remain about roles of key integrated management products in NetWare environments.

By Caryn Gillooly
Senior Editor

NEW ORLEANS — As expected, Computer Associates International, Inc. (CA) and Novell, Inc. last week announced a strategic development agreement under which CA will port its CA-Unicenter mainframe and midrange management product to NetWare environments.

However, it seemed clear last week that the two companies have different views as to how users should implement the new offering, which will be called Unicenter for NetWare.

Novell wants customers to use the new product as a bridge between its NetWare Management System (NMS) platform and minicomputer and mainframe environments, while CA wants NetWare users to adopt Unicenter for NetWare as their primary local-area network management system.

The product itself will be a set of NetWare Loadable Modules providing NetWare administrators with high-end system management capabilities such as security, report generation and problem management ("CA, Novell team on LAN management," *NW*, Aug. 17).

The system's management console will be based on IBM's OS/2 Presentation Manager graphical user interface, not Microsoft Corp.'s Windows as previously thought. Company executives said the product should be available in about a year.

In a joint teleconference to discuss the announcement, the companies gave little insight into how NMS and Unicenter for NetWare will fit together. In fact, Novell and CA executives offered some diverse views on the role the products will play in NetWare environments.

Although Unicenter for NetWare will have some similar capa-

(continued on page 12)

Tiny Ethernet adapter for on-the-go users released

By Margie Wylie
Senior Editor

CALABASAS, Calif. — Xircom, Inc. last week introduced a tiny Ethernet card designed to fit into a special slot developed for small computers with limited power supplies and almost no space for internal expansion.

The Xircom CreditCard Ethernet Adapter, due out this fall, will fit into a slot developed by the Personal Computer Memory Card International Association (PCMCIA). The slot, about the area and width of a credit card, is expected to be the primary means through which users will add memory, applications, adapters and other communications add-ons to an emerging class of ultralight computers, said vendors and analysts at MobileNet '92 in Santa Clara, Calif., earlier this year.

"We've been seeing widespread support [for the PCMCIA standard], and we expect that sometime next year, it will become the key means of expansion for notebooks, palmtops and other small computers," said Dirk Gates, president and chief executive officer of Xircom.

Currently, about six vendors offer a single PCMCIA slot in their products. Those machines would have to give up their single expansion slot to connect to a net today, but analysts and hardware makers have said they expect multiple-slot machines to appear when the standard becomes more widespread and when smaller computers are more common.

Xircom's card is a 10M bit/sec Ethernet adapter that will work with Version 2.0 of the PCMCIA standard.

Like other PCMCIA cards, the adapter is installed by sliding it into the multipurpose slot, where it snaps into the 16-bit bus. Users then select the software driver

(continued on page 12)

CA, Novell discuss Unicenter strategy

continued from page 11

bilities to those provided through Novell's NMS and NetWare Services Manager — the primary application under the NMS architecture — the LAN vendor insisted the product is not designed to manage LANs.

"NMS is designed to monitor devices on the [LAN]; Unicenter [was originally] designed to manage applications at the mainframe level," said Gerry Machi, vice-president and general manager of Novell's Network Systems Group in San Jose, Calif.

According to Machi, many users are going through the down- or rightsizing process, in which their mainframe applications must interact with LAN environments. He suggested that customers will have NMS implemented at the LAN level and NMS will then interface with a "manager of managers" such as Unicenter.

Unicenter for NetWare will be able to send alerts and alarms about the NetWare LAN up to a central Unicenter console controlled by mainframe administrators. This way, the system administrators will be able to see a part of the network — the NetWare LAN — they could not see before.

However, CA's Kurt Seibert, vice-president of strategic business, insisted that Unicenter for NetWare will be more than just an interface. It will provide the functionality and integrated set of capabilities needed for managing a NetWare LAN. The offering will, in fact, be able to serve as a complete LAN management platform, according to CA executives.

Seibert explained that Unicenter for NetWare will be able to manage any number of processes within a NetWare environment, such as logon facilities, event scheduling and storage. In such a scenario, the Unicenter central console would control this information at the NetWare level.

Given the diverging views, users may be left wondering just how to view Unicenter for NetWare. Buying both the CA offering and NMS could be problematic since the products would each require its own management console and their functionality appears to overlap. Users may also balk at deploying Unicenter for NetWare simply as a means for sharing information with a host-based manager. ◘

Netnotes

continued from page 11

operating system files. Users must start up from the special client diskette to allow managers to update their operating system software over the network.

While affordable, the entry-level software does not offer the sophisticated updating options that come with more expensive products from third parties.

The product is available through Apple dealers and directly from Apple Support Products at (800) 950-2442.

Spry, Inc. of Seattle, Wash., is shipping software that lets Unix-based workstations act as clients to Novell, Inc. NetWare file and print servers. Although Novell sells software that lets Unix machines double as NetWare servers, the company does not support Unix clients.

The new software, called SprySoft NetWare Client for Unix, offers the two pieces of software necessary to allow users to access NetWare servers. Redirector software enables Unix users to map drives and access files and print services as they would through local, native Unix commands. A NetWare Internetwork Packet Exchange (IPX) protocol stack offers Unix users the low-level links necessary for transparent, native access to the NetWare server.

SprySoft NetWare Client for Unix sells for $495 per user for the Santa Cruz Operation, Inc. SCO Unix Version 3.2 and higher, and $995 per user for Sun Microsystems, Inc.'s SunOS Version 4.11 and up. ◘

Tiny Ethernet adapter released

continued from page 11

that works with their network operating system from the drivers loaded in the card's flash memory. Xircom will ship drivers compatible with Novell, Inc. NetWare, ArtiSoft, Inc. LANtastic, Digital Equipment Corp. Pathworks and Microsoft Corp. LAN Manager, among others.

The CreditCard Ethernet Adapter will also be certified for use with small notebook or palmtop computers from vendors including Sharp Electronics Corp. and Toshiba Corp., according to Xircom.

A power conservation feature keeps the card from draining battery power when it is not in use. On-board flash memory will allow users to update drivers and other card software without trading in hardware. On-board LEDs will enable them to monitor activity status when the card is in use.

Xircom has not set a price for the CreditCard Ethernet Adapter. ◘

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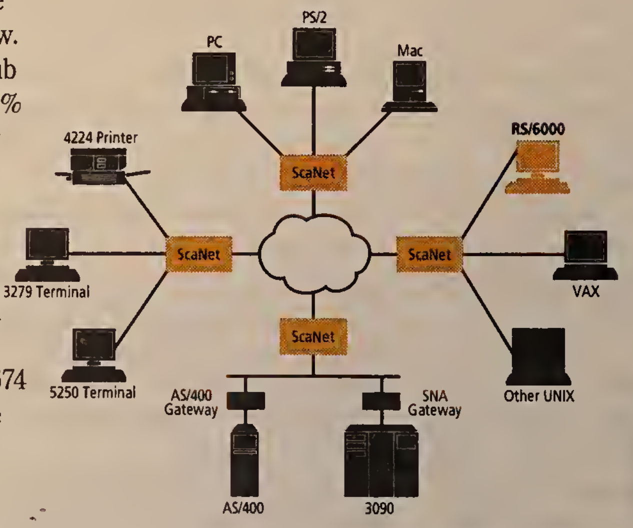

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Worth Noting

> "From a high-speed data requirement perspective, we believe it won't be until 1996 that users will see a need to go beyond segmented FDDI."
>
> **Edgar Masri**
> Director of business development
> 3Com Corp.
> Santa Clara, Calif.

Link Notes

Effective Sept. 1, **Hewlett-Packard Co.** will drop the price of its EtherTwist family of fixed-port 10Base-T hubs by as much as 17%, reducing the per-port cost to less than $80.

The company also plans a promotion that will give net managers a free copy of HP 27256D OpenView Interconnect Manager/DOS when they purchase three HP hubs, bridges or routers between Sept. 1, 1992, and Jan. 31, 1993. The software lists for $4,000. For more details, contact HP at (800) 752-0900.

Cisco Systems, Inc. last week penned an agreement to supply routers for the new network systems integration unit of **Bell Atlantic Corp.** Cisco joins Novell, Inc., Banyan Systems, Inc., Cabletron Systems, Inc. and SynOptics Communications, Inc. as a supplier for Bell Atlantic's net integration business.

Northern Telecom, Inc. has unveiled its Integrated Building Distribution Network, which is an end-to-end structured wiring system that supports 100M bit/sec Fiber Distributed Data Interface over unshielded twisted pair. Contact Northern Telecom at (800) 999-6732 for more details. ◪

Radlinx airs multiprotocol gateway to hosts, AS/400s

Device supports DECnet, TCP/IP, other nets.

By Maureen Molloy
Senior Writer

HUNTINGTON BEACH, Calif. — Radlinx last week announced a multiprotocol gateway that allows workstations attached to DECnet, Local Area Transport (LAT), TCP/IP or X.25 networks to access IBM mainframe- and AS/400-based applications.

The Gatelinx 1000 enables devices attached to Digital Equipment Corp. DECnet and LAT, Transmission Control Protocol/Internet Protocol or X.25 nets to emulate an IBM 3270 terminal. It provides application-layer services such as terminal emulation, file transfer, application program interfaces and remote printing.

The device will enable a Systems Network Architecture host application, for instance, to access a printer connected to a TCP/IP net. It can also enable a LAT terminal user to access SNA applications.

Based on a Unix 386 platform, the gateway supports token-ring, Ethernet, Synchronous Data Link Control and X.25 links. It appears to an SNA net as a PU Type 2, to a DEC network as a LAT host and to a TCP/IP net as a TCP/IP host.

The Gatelinx 1000 provides asynchronous terminals or personal computers direct access to SNA 3270 applications and to hosts connected to TCP/IP or LAT networks. It also enables terminals or PCs connected to a packet assembler/disassembler on an X.25 network to access SNA, TCP/IP or LAT networks.

In addition, it supports TCP/IP routing over X.25 nets.

The gateway supports the Simple Network Management Protocol and IBM's NetView and is also equipped with an X Window System/Open Systems Foundation, Inc. Motif graphical user interface.

Available now, the Gatelinx gateway costs between $13,500 and $18,000, depending on configuration.

Radlinx, based in Tel Aviv, Israel, will resell the gateway in the U.S. through RAD Network Devices, Inc., based here.

For more information, contact Radlinx's Western regional sales manager at (714) 891-1446. ◪

Cabletron offers access to Spectrum mgmt. database

By Skip MacAskill
Staff Writer

ROCHESTER, N.H. — Cabletron Systems, Inc. last week announced a new gateway that will open up the database in its network management system to give users more flexibility in compiling network information and customizing net reports.

The Spectrum Data Gateway — jointly developed by Cabletron and SAS Institute, Inc. through Cabletron's Spectrum Partners' Program — enables users to link the data collection functionality of Spectrum with the management, analysis and presentation features of SAS Institute's report-writing software tool kit, SAS System.

"By opening up the Spectrum database and providing access to SAS System, we're allowing users to employ and develop a number of management information applications that will help them format and analyze their management data," said Bill Tracy, development manager of Spectrum applications at Cabletron.

Previously, Spectrum, which is Cabletron's Simple Network Management Protocol-based net management system, only allowed users to access its database through prepackaged report-writing features that provided net information in raw data form.

Users, for example, could only get information on a single Cisco Systems, Inc. router. With the capabilities that come with SAS System — which supports SQL — they can now get information on all the Cisco routers in the net.

The new gateway, which is software that runs on the Unix workstation supporting Spectrum, will come equipped with a standard set of report and analy-

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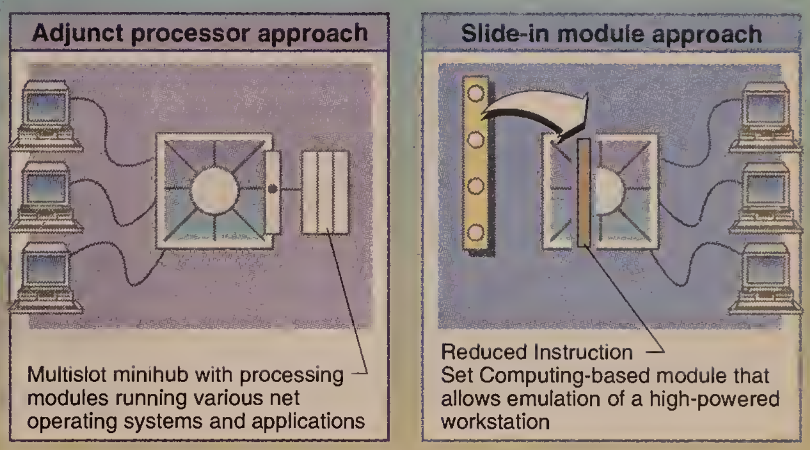
Would you like your server with the hub or on the side?


Adjunct processor approach
Multislot minihub with processing modules running various net operating systems and applications
Slide-in module approach
Reduced Instruction Set Computing-based module that allows emulation of a high-powered workstation

Vendors have taken different approaches to building LAN server functionality into hubs in order to enable them to run various network operating systems and LAN applications.

GRAPHIC BY SUSAN J. CHAMPENEY

Hub-based servers aren't for everyone

Integration may meet needs of some users, but high-performance nets need separate servers.

By Skip MacAskill
Staff Writer

In the ongoing effort to increase the functionality of today's network catchall device — the hub — vendors are now offering a variety of LAN server capabilities in their boxes.

For small local-area networks and remote offices, incorporating server functionality in the hub could ease management and increase net performance. But users and analysts say larger LANs will still need the power and features of a stand-alone server or superserver.

"When you start integrating specialized capabilities, such as server functionality, into the hub, it just doesn't make sense," said Jeff Marshall, managing director of communications for Bear, Stearns & Company, Inc. "It does make sense from a management viewpoint, however, to integrate that functionality in small offices that need to be remotely managed."

Ungermann-Bass, Inc. recently extended the capability of its Access/One hub to support a slimmed-down version of Novell, Inc. NetWare 3.11, as well as a variety of NetWare Loadable Module and other LAN applications.

Other hub makers, including Cabletron Systems, Inc. and SynOptics Communications, Inc., have developed server modules for their hub lines that offer the functionality and power of Reduced Instruction Set Computing (RISC)-based processors such as Sun Microsystems, Inc. SPARCstations, allowing users to run net applications on the hub.

The real advantage in moving LAN server functionality into the hub can be found in improved net management and performance.

"The UB platform essentially offers a common management bus between the hub and the server," said Nick Lippis, principal at Strategic Networks Consulting, Inc. in Rockland, Mass. "What you get is combined server and network management capabilities, which is one of the key benefits of this integration.

> "By moving these capabilities into the hub, the user can increase performance."
>
> ▲▲▲

"By moving these capabilities into the hub, the user can increase the performance by reducing the distance traffic must travel," he added. "The user can also gain a greater measure of network control because everything is at the box."

(continued on page 16)

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Cabletron offers database access

continued from page 13

sis functions that Cabletron engineers developed in-house using SAS System. These applications are accessible through Open Software Foundation, Inc.'s Motif graphical user interface.

Delmarva Power & Light Co., for example, has been asking for this capability for a couple of years and is eager to use the gateway to do some long-range network capacity planning.

"We gather a rather immense amount of data off our internet using Spectrum, and while we have some fine tools to look at it in real time, we have no historical database to speak of," said John Scoggin, network supervisor at the utility, based in Wilmington, Del. "The SAS-Cabletron gateway will allow us to archive that real-time data and reduce it."

By using SAS System, users can also develop their own applications and tailor the report writing to their requirements. These reports can be used for a variety of management functions, including trend and performance analysis as well as net planning.

Since Delmarva is also a large Banyan Systems, Inc. VINES shop and has SNMP proxy agents in its servers, the customized application feature of the gateway will let Scoggin keep better track of parameters such as server loadings, volumes of server traffic and trends.

The Spectrum Data Gateway, which includes the standard set of Cabletron-developed report applications, is priced at $1,000 and will be available next month.

SAS System is available now through SAS Institute. It is priced on an annual license fee, which is $895 for the first year. That price includes Base SAS, the foundation component users need to access the Spectrum database.

Hub servers not for everyone

continued from page 13

While that approach will meet the needs of small and midsize networks, larger nets with high-performance requirements dictate a dedicated file server.

"For file servers, you want separate machines that are independent and more powerful and allow you to easily upgrade the hard drive and memory as well as add more storage," explained Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif.

Some vendors believe that a hub configured with a broad range of functionality, including LAN server capabilities, appeals to a niche market at best.

"It doesn't make sense to build a box that does everything because you'll be overburdening it with too much cost for too small a niche," said Frank Fuller, director of product management at Chipcom Corp., which offers a terminal server module for its ONline hub series but has no short-term plans to provide other server capabilities.

Worse still, integrating server capabilities into the hub may limit users' flexibility. "If you want to upgrade the server module, then you're really constrained to whatever the hub vendor offers you," Howard added.

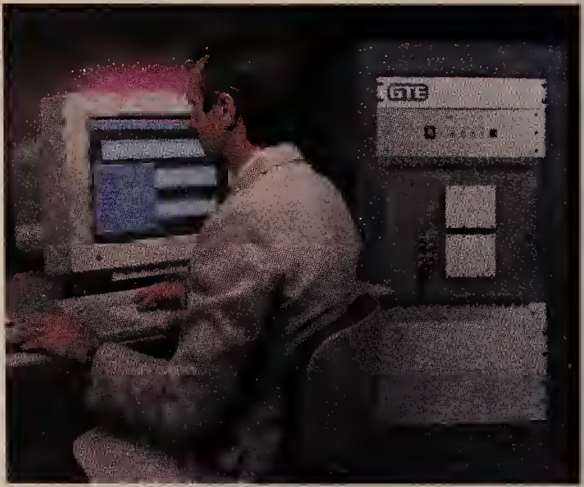
Currently, this server integration is offered through either the adjunct processor approach that UB uses with its Access/Open or the slide-in hub modules used by Cabletron and SynOptics.

In the UB method, a three-slot minihub that runs a variety of network operating systems and other LAN applications is attached to the company's flagship hub, the Access/One. The RISC-based modules provided by the other two vendors, however, fit directly into their hubs.

"You have to hook a wire from the Access/One to the Access/Open, so why not just attach the Access/One to a file server?" Howard asked. "The advantages of the slide-in module are that you don't need a separate box, the wiring closet is cleaner and it plugs into the Ethernet backplane."

Industry observers agree that while users are not demanding this type of server-in-the-hub functionality, it may become an important element of the net infrastructure.

"It's not going to take the industry by storm, but it may eventually become another set of modules that may help simplify network design," Howard said. "The real question is whether the advantages will outweigh the limitations of putting it into the hub."



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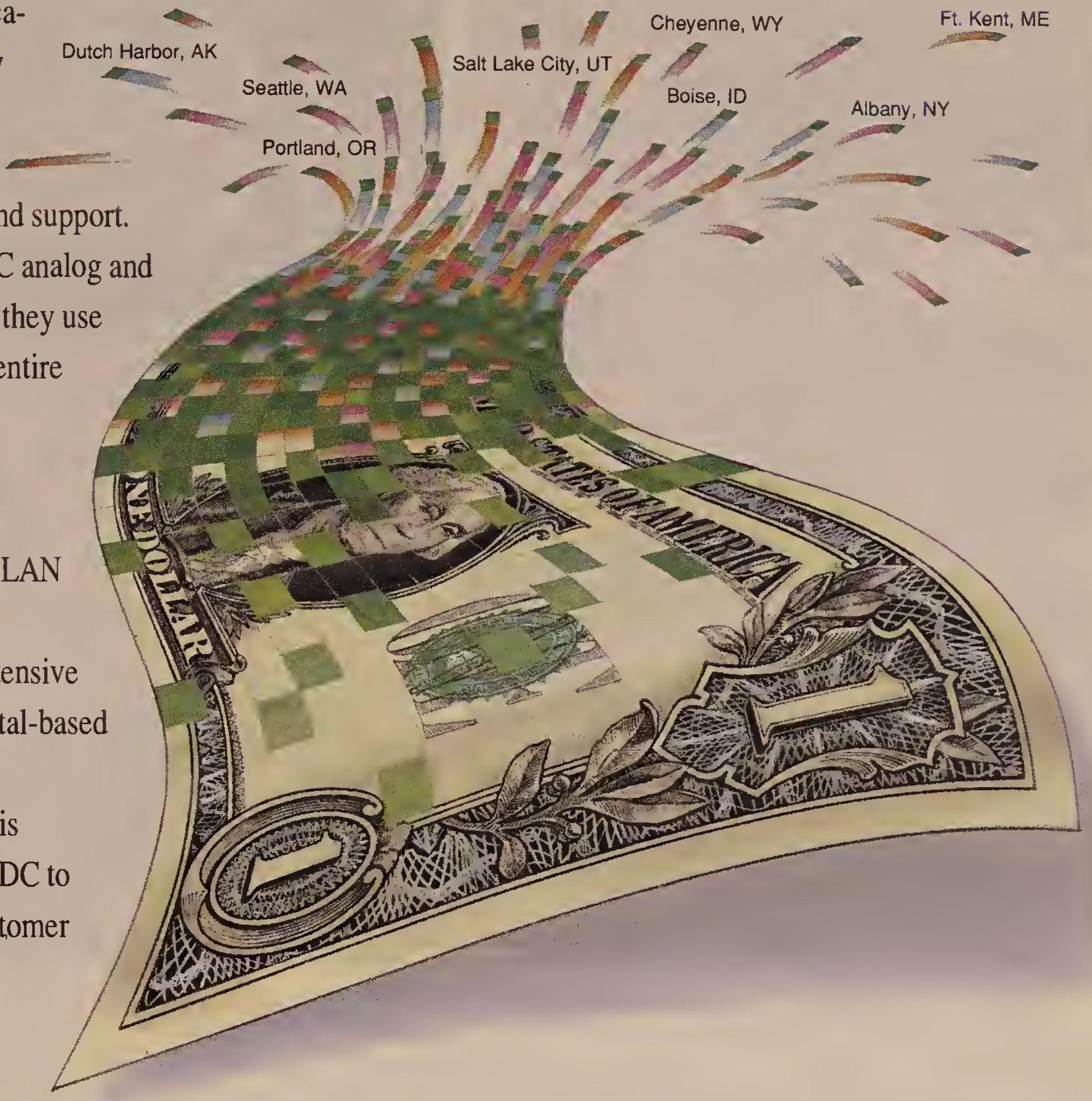

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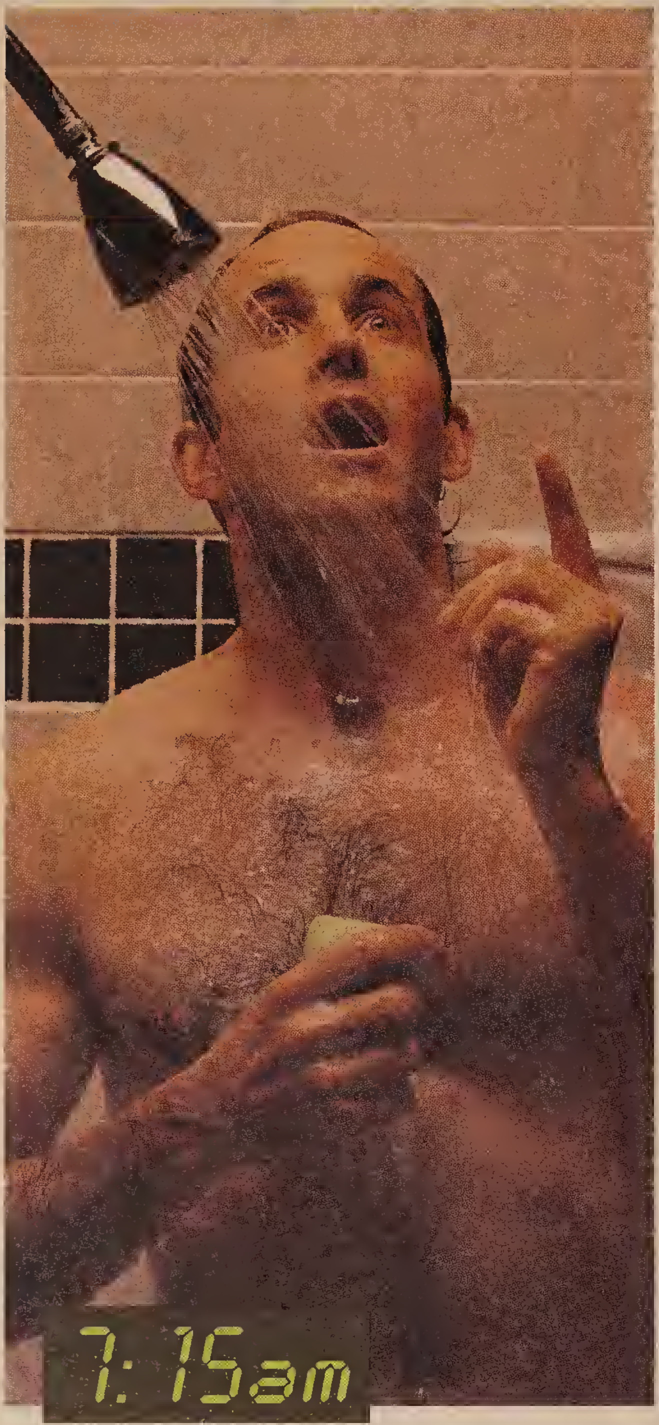

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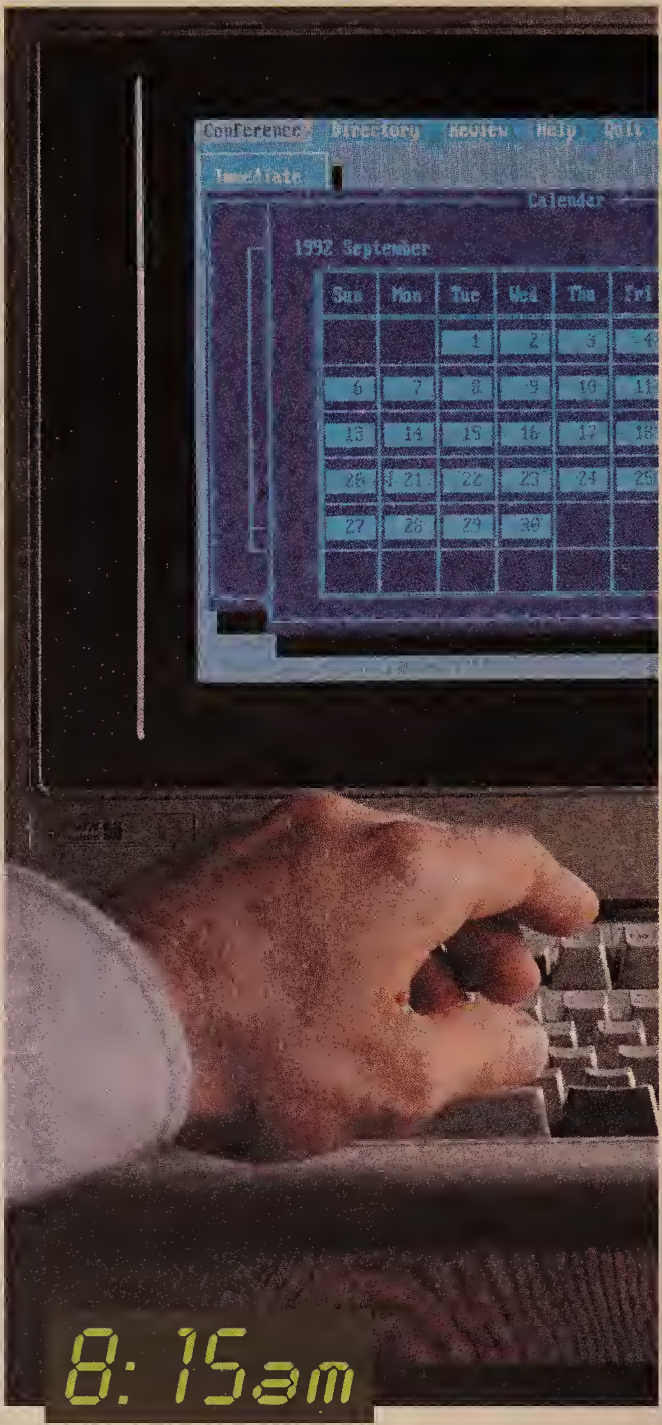

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Worth Noting

> "What we've seen AT&T do over the past several months is start charging users for value-added items, like service monitoring, that were previously standard features. I'd expect other carriers to do the same."
>
> **Bob Self**
> President
> Market Dynamics
> A New York-based tariff analysis and network design firm

Regulatory Update

The federal agency responsible for overseeing government use of radio spectrum last week soundly batted down a suggestion that some government frequencies could be given up for commercial purposes such as personal communications services (PCS) or fixed microwave.

The **National Telecommunications and Information Administration (NTIA)**, which manages government use of spectrum and serves as an advisory agency on technology matters to the executive branch, last week issued a report saying government frequencies are too crowded to share. It said that, although the new wireless voice and data services could help boost the economy, government uses outweigh those considerations.

The spectrum in question is the 1.71-GHz to 1.85-GHz band. It is currently used by the federal government for microwave networks, satellite control stations, air and land combat training systems, civil disaster response and radio astronomy. But because it is adjacent to the 1.8-GHz to 2.2-

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US West unit introduces LAN interconnection service

Offering supports speeds up to 16M bit/sec.

By Bob Wallace
Senior Editor

DENVER — US West, Inc.'s Advanced Communications Services (ACS) business unit last week detailed plans for a local-area network interconnection service that will enable users to link LANs at speeds up to 16M bit/sec.

The announcement makes US West one of the first carriers to roll out a LAN interconnection service that supports higher speeds than frame relay, though others are expected to follow suit in the coming months.

The service, dubbed Transparent LAN Service, includes equipment and fiber-optic circuits that will enable users to link Ethernet and token-ring LANs. It is intended as an alternative to high-speed dedicated lines for linking LANs in major metropolitan areas.

The company decided to roll out the service rather than risk losing customers to alternate access service providers, which are expected to launch similar offerings. "This is a preemptive strike against our competitors," said Jerry Parrick, vice-president of customer solutions for ACS.

Parrick said US West already has six customers lined up for the service and could get 40 more in the near future. "We hadn't expected this much user demand for it."

Transparent LAN Service can be used with 4M and 16M bit/sec token-ring and 10M bit/sec Ethernet LANs. The offering will initially enable users to link up to seven LANs but will support 15 by year end.

Customer LANs are linked to a Racal Datacom PremNet 5000 fiber-optic multiplexer at the user site. That device multiplexes electrical signals into a single optical signal for transmission at 4M, 10M and 16M bit/sec over fiber to a PremNet 5000 in the US West central office.

From the central office, customers can use private lines, frame relay or Switched Multimegabit Data Service to link to other central offices.

US West has filed general tariffs for Transparent LAN Service in 14 cities in its 14-state territory but will deploy the offering in other cities as demand warrants.

(continued on page 23)

Mapping the logical path to ATM implementation

By Marvin Chartoff and David Yuen
Special to Network World

Asynchronous Transfer Mode (ATM), a switching technology based on 53-byte calls, has captured the world's attention as a panacea for high-speed networking connectivity in both campus and wide-area environments.

ANALYSIS

While it would be difficult to argue that other technologies can match ATM's speed and voice/data/video integration capabilities, there are two major caveats for managers considering ATM for their network infrastructure.

First, an end-to-end ATM enterprisewide network will not be feasible until 1995. Second, there are no direct ATM interfaces for the large installed base of workstations attached to shared bandwidth local-area networks and multiprotocol routers.

The key question is whether to wait for ATM or to implement today's technologies such as frame relay and Fiber Distributed Data Interface.

Based on the announced product strategies of ATM switching and customer premises equipment vendors, future ATM products will provide the necessary backward compatibility and migration paths to allow organizations to make investments in other technologies today without risking obsolescence.

Therefore, frame relay services — public or private — and FDDI backbone networks should be implemented today for high-performance LAN-to-LAN applications, with later upgrades to ATM as required. A closer exami-

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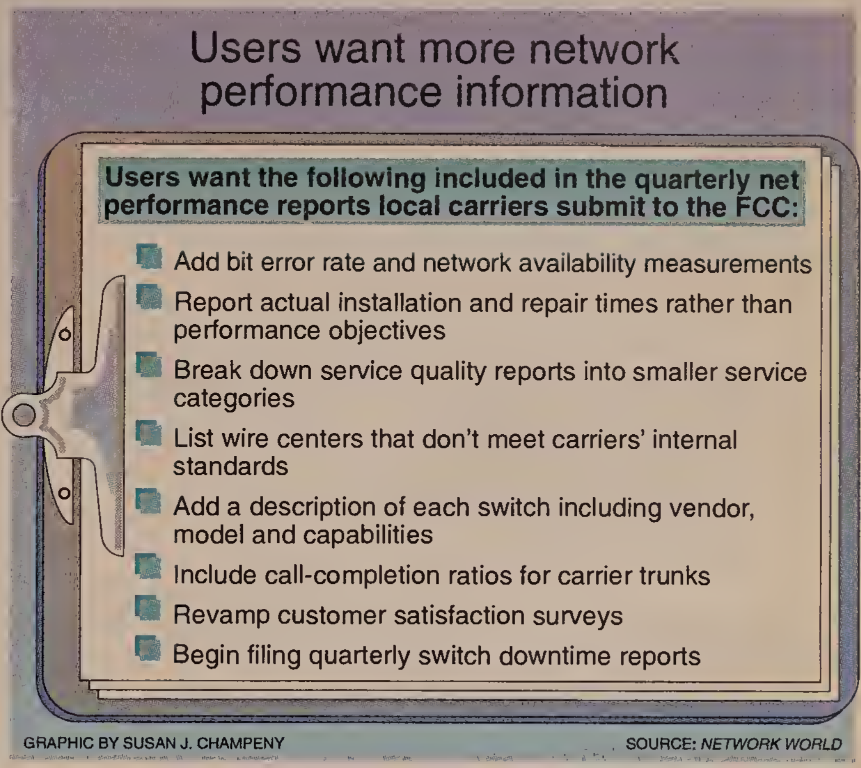


Users want more network performance information

Users want the following included in the quarterly net performance reports local carriers submit to the FCC:

- Add bit error rate and network availability measurements
- Report actual installation and repair times rather than performance objectives
- Break down service quality reports into smaller service categories
- List wire centers that don't meet carriers' internal standards
- Add a description of each switch including vendor, model and capabilities
- Include call-completion ratios for carrier trunks
- Revamp customer satisfaction surveys
- Begin filing quarterly switch downtime reports

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: *NETWORK WORLD*

Users seek in-depth carrier net reports

Groups push FCC to require carriers to provide detailed information about network performance.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Users concerned about network quality last week urged the FCC to adopt expanded quality reporting requirements the agency proposed in July.

In filings with the Federal Communications Commission, users said they strongly support proposals that would require carriers to provide more facts on network quality because the information local carriers have to submit today is incomplete and too highly aggregated to be useful.

As data traffic increases on the public network, detailed information concerning net performance is critical, users argued. Among the FCC proposals consumers support are adding information to carrier reports on bit error rates, network availability, repair intervals and expanding information on switch outages (see graphic, this page).

Concerns about the adequacy of the FCC's current reporting requirements has grown since the agency lessened regulations for carriers through proceedings such as price caps. Users fear that price cap regulation, which gives carriers the ability to reap more profits by cutting costs, could encourage carriers to delay or eliminate vital network investment and maintenance.

The Tele-Communications Association, Inc. (TCA) as well as other major user groups, such as the International Communications Association (ICA) and the Ad Hoc Telecommunications Users Committee have all expressed concerns about the impact of price cap regulation on service quality.

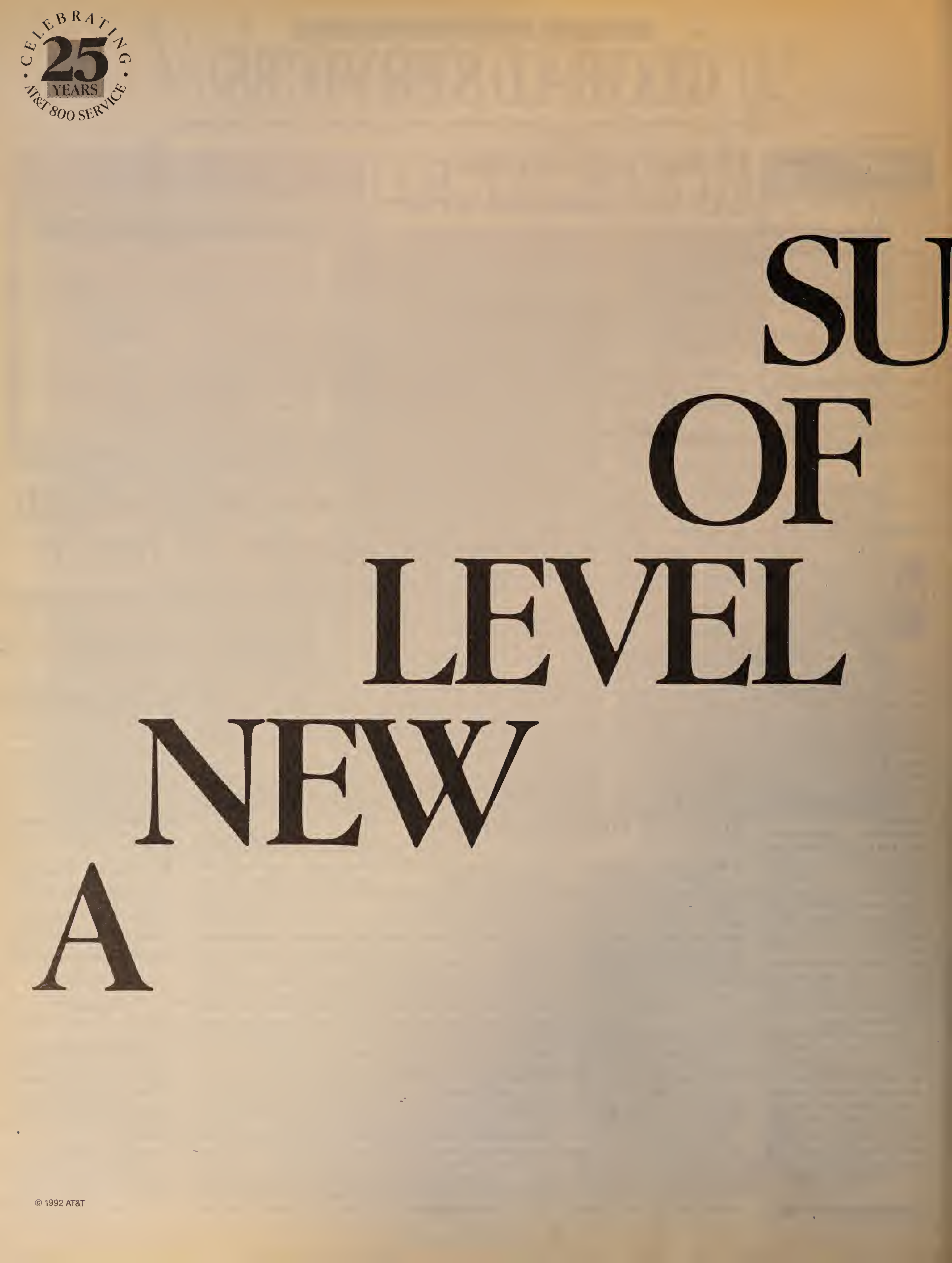
> Users fear that price cap regulation could encourage carriers to delay or eliminate vital network investment and maintenance.

▲▲▲

User groups, particularly TCA and ICA, have pressed the FCC for a range of other improvements, including adding performance standards to tariffs and expanding network outage reporting requirements.

The FCC has come to rely on its reporting system, known as the Automated Reporting Management Information System

(continued on page 22)



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Users seek in-depth reports

continued from page 19

(ARMIS), as virtually the sole backstop to detect and prevent network problems.

Under pressure from users, the FCC in May 1991 added new data reporting requirements for ARMIS reports to help detect any potential network quality problems resulting from price cap regulation. Last month, the agency proposed a number of improvements.

TCA applauded those proposals, saying they “evidence a serious commitment to improve [existing ARMIS] requirements. However, the groups said more is needed. TCA, which has championed improved network quality reporting, asked the FCC to go beyond its proposed improvements in some areas of data collection.

The group noted that data communications is growing at 35% per year. Therefore, it is of great importance to have better service quality monitoring capabilities.

TCA pushed the FCC to require carriers to break down information that is currently submitted into more narrow, usable categories. Currently, data is so highly aggregated that it may not be possible to detect service problems for a single category of service.

The group urged the FCC to require that information on access services be broken down into four groups — switched access, voice-grade private lines, T-1 and T-3. TCA said information on local services should be broken down into four groups as well — residential service, standard business lines, private branch exchange trunks and Centrex service.

It also asked for state-by-state reports on T-1 and T-3 service. These reports should be required when carriers have implemented extended superframe format — a T-1 and T-3 monitoring technology — on 30% of their data lines.

Carriers responded to the user comments by telling the FCC last week that proposals for expanding reporting requirements will be too costly and burdensome. A common complaint was that the FCC is moving too quickly to expand the reporting rules since the extended requirements for price caps went into effect about a year ago.

Some suggested that the FCC wait until its comprehensive review of price cap regulation in 1994 before it beefs up reporting requirements.

Mapping the logical path to ATM

continued from page 19

nation of those initial ATM product plans will clarify how that migration path will work.

ATM technology

ATM defines both a multiplexing and switching technology, as well as a user-to-network interface, for Broadband Integrated Services Digital Network services. ATM is based on 53-byte fixed-length cells, which consist of 5 bytes of header information and 48 bytes of user data known as the payload. The ATM adaptation layer processes information into ATM cells. Standard ATM interfaces are defined to operate at 155M or 622M bit/sec.

However, ATM switches used to relay cells can also interoperate with other user-to-network interfaces, such as frame relay, using the Link Access Procedure D signaling format or Switched Multimegabit Data Service (SMDS) using the IEEE 802.6 Distributed Queue Dual Bus standard. ATM switches can also support LAN interfaces such as FDDI, or IEEE 802.3, or 802.5, meaning they can be used to build campus backbones.

Carriers such as AT&T, MCI Communications Corp. and Sprint Corp. have indicated that they intend to offer cell-based switching services using the frame relay interface in the 1993-1994 time frame.

AT&T's frame relay service is based on StrataCom, Inc.'s IPX switching platform, with a planned upgrade next year to interconnect those IPX switches with AT&T Network Systems' Broadband Networking Switch (BNS)-2000 in the backbone network using cell-based internodal trunks. The BNS-2000 supports both frame relay and SMDS.

Sprint's frame relay service is based on its TP4900 switch platform, with future plans to support cell relay switching and ATM interfaces in 1993.

The MCI frame relay service, just recently announced, is based on a cell platform from Siemens Stromberg-Carlson that supports frame relay and SMDS interfaces.

Networks supporting LAN-to-LAN traffic using multiprotocol routers interconnected with public frame relay services could be seemlessly upgraded by the carrier to support ATM switching.

The frame relay interface would remain the same, but the carrier would segment the traffic into cells and transport them using ATM technology. Users would likely see improved performance since the transit delay through the carrier network is lower using ATM and the probability of congestion is reduced.

Other switch vendors have incorporated frame relay interfaces in their ATM switch platforms. The target market for these products is the regional Bell holding companies and foreign telephone companies.

The Fujitsu America, Inc. FETEX-150 ATM switch will include subscriber interfaces for frame relay and SMDS by 1993. The firm is currently involved in a trial with BellSouth Corp.

The Siemens Stromberg-Carlson EWSM switch will initially support frame relay and SMDS interfaces in the 1992-1993 time frame, with future upgrades to a full-function ATM switch expected in the 1994-1995 time frame. The EWSM is being trialed by several post, telegraph and telephone administrations in Europe and several RBHCs in the U.S.

The promise of being able to deploy a frame relay network with future upgrades to ATM technology looks very encouraging

Psychologists call something that runs continuously, without pause or interruption, an obsession.

(When the same thing happens on your network, it's called the LinkBuilder ECS hub.)

from the public carrier and switch vendor perspective. Users may be considering upgrade paths to ATM from shared-bandwidth LANs in the local campus environment, as well.

ATM CPE

Recent announcements of ATM products, due in the 1993-1994 time frame, have focused on providing LAN switching in the campus environment. These announcements were to sound the FDDI death knell for high-speed LAN interconnection.

However, FDDI does not have to be considered a throw-away technology because of the backward compatibility being promised in the initial ATM products.

Intelligent wiring hub vendors are planning to incorporate ATM switching technology into their product lines. While their approaches vary slightly, the basic concept is to preserve the existing installed base of Ethernet and token-ring interface cards in workstations and shielded and unshielded wiring from the desktop to the wiring closet, where the hub is located.

Eventually, users will be able to integrate FDDI and ATM technologies into a single hub, with desktop LANs interfacing to the backbone networks using bridge or router cards.

Other customer premises equipment vendors are also putting significant effort into defining products that support ATM. For instance, Adaptive Corp., a majority-owned subsidiary of Network Equipment Technologies, Inc., is developing the ATMX switch, a local ATM switch that can support up to 1.2G bit/sec of aggregate switching capacity. The ATMX provides gateway interfaces to Ethernet, token-ring and FDDI LANs to support high-speed LAN-to-LAN connectivity.

Router competitors Cisco Systems, Inc. and Wellfleet Communications, Inc. are also considering entering the ATM switch market. Going beyond current plans for user-to-network ATM interfaces for their router products, both vendors may provide full-function ATM switches for the local campus internetwork market.

The next logical step beyond using ATM switching technology to link hubs is to provide ATM interfaces to the desktop. Most intelligent wiring hub and other customer premises equipment vendors will be developing workstation interface cards, initially for high-powered devices such as workstations from Sun Microsystems, Inc. and the Apollo Division of Hewlett-Packard Co.

These ATM cards will replace existing Ethernet or token-ring cards, while desktop-to-wiring closet cabling would have to be replaced with fiber. This would enable users to selectively upgrade workstations to ATM as bandwidth requirements increase, without having to make fundamental changes to the network design.

It has been a long time since the networking industry has seen a technological advance such as ATM that promises such significant changes.

With other technologies such as frame relay and FDDI just stabilizing, the thought of waiting or switching to ATM has raised some major concerns.

However, the backward compatibility and smooth migration paths should lessen those concerns. Network managers can make the necessary investments today in order to meet their imminent network challenges while maintaining a clearly defined path for upgrading to ATM tomorrow.

Chartoff is a principal and Yuen a senior consultant with Ernst & Young, a Vienna, Va., consultancy.

US West intros LAN service

continued from page 19

In some cities, US West will offer Transparent LAN Service over existing 100M bit/sec dual counterrotating fiber rings, which protect users from cable cuts. If one ring is lost, traffic is rerouted to the second in milliseconds.

Fiber will be installed as necessary to support the service, and the special construction costs will be added to customer fees. This will substantially increase the cost of the service for some users.

The carrier pointed out a few limitations of the service. Initially, only token rings can be connected to token rings and Ethernets to Ethernets. And the service doesn't yet support voice or video traffic, which would be useful for multimedia applications.

US West said a four-site Transparent LAN Service partially protected star — in which each site can send traffic in two directions — is 7% more expensive than a four-site T-1 partially protected star.

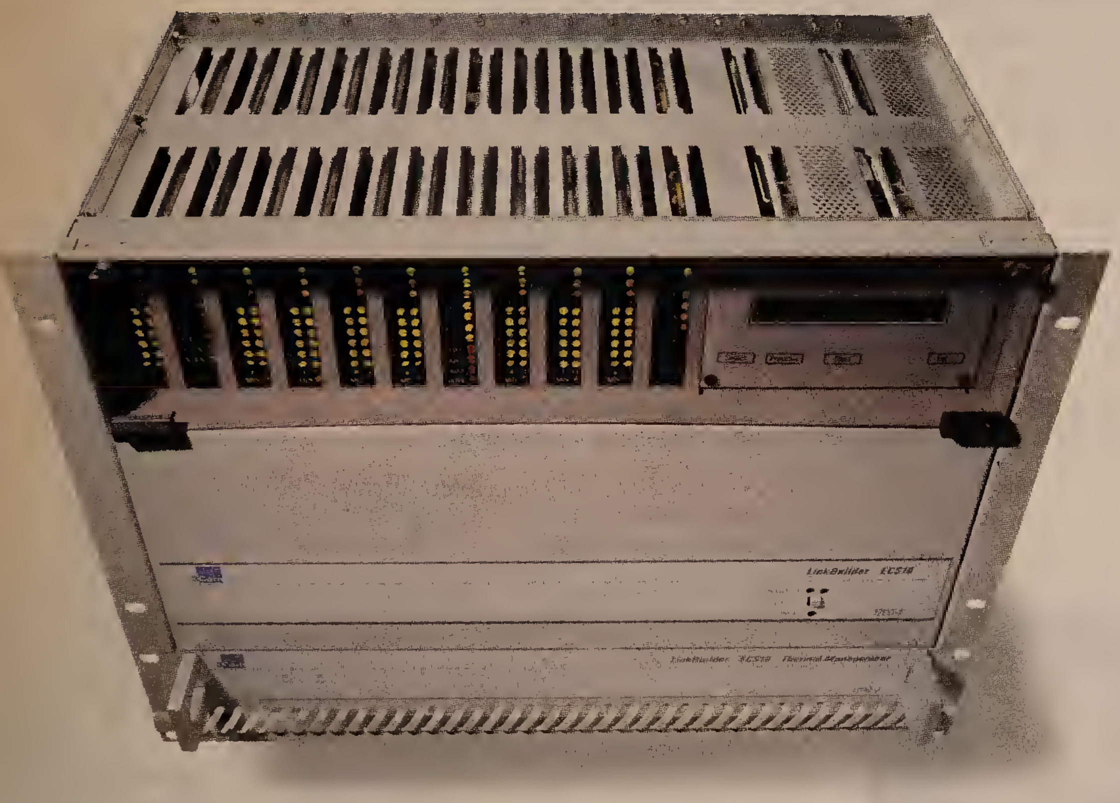
However, a five-site Transparent LAN Service partially protected star is 9% less than a five-site T-1 partially protected star. US West included the cost of channel service units in its comparisons.

Pricing for Transparent LAN Service comprises two monthly components — a $750 data link charge for the fiber link from the user site to the serving central office and a per-site multipoint feature charge.

With the multipoint feature charge, users pay $150 for three sites, $400 for four sites, $750 for five sites, $1,050 for six sites and $1,400 for seven sites. Customers also pay a onetime $700 charge.

Users that sign multiyear contracts for the service will realize discounts. Companies that agree to a two-year contract receive a 10% discount, while those that sign three- or four-year agreements get a 15% discount and firms that sign a five-year deal qualify for a 20% discount.

Transparent LAN Service is already available in some cities and will become available in others soon.



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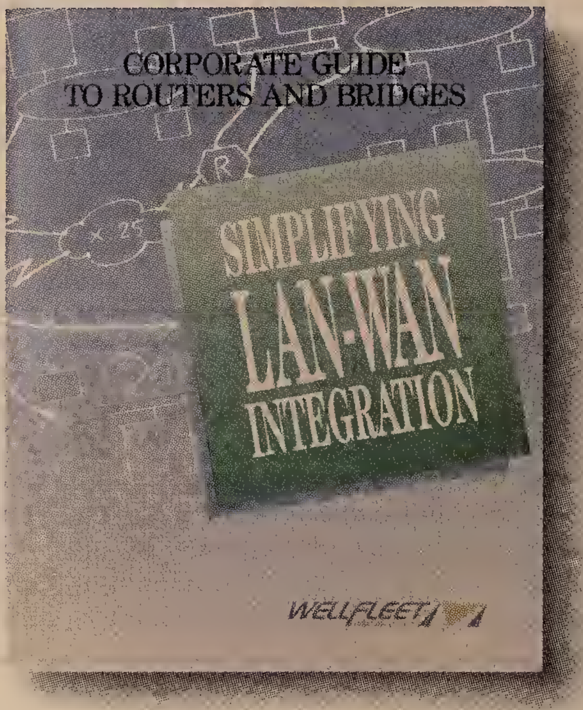
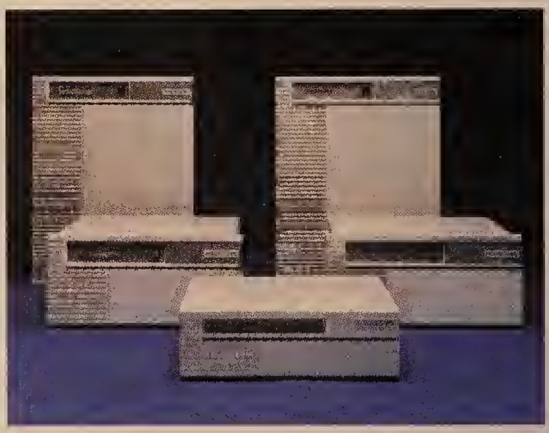
Circle Reader Service #114

You've Really Got To Hand It To Any IS Professional Who Wants To Understand LAN/WAN Integration.





After all, internetworking is a challenging subject – especially if it's not your primary focus. Fortunately, Wellfleet has produced a comprehensive guide that removes the mystery from internetworking. The guide is perfect for anyone who wants to gain a more thorough understanding of routers and bridges, communications protocols, internetwork design and cost-justification, and selection criteria. Call **1-800-448-3400, Ext. 501W** for a free copy, or to send a complimentary copy to a colleague. Whether you're an internetworking expert or novice, it's sure to come in handy.

WELLFLEET communications

When Your Networks Are Complex, Your Choice Is Simple.

Circle Reader Service #112

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Worth Noting

"With its bankruptcy filing, the only way that Wang [Laboratories, Inc.] is going to find corporate customers for its software is if the products are unique or business-critical."

Ann Palermo
Research director
International Data Corp.
Framingham, Mass.

Store & Forward

Design Consultants, Inc. has unveiled work flow software for information systems departments that routes service and work requests from end users to the appropriate IS personnel.

StarPro runs on IBM Network Basic I/O System-compatible local-area networks and provides a seamless interface to most end-user word processing programs. It has project management capabilities that let the departments assign, schedule and track work based on end-user requests.

LAN licenses cost between $10,000 and $26,900, based on the number of users.

Network Management, Inc. (NMI) recently announced an agreement with Sun Microsystems, Inc. to provide systems integration services to Sun customers trying to move host-based applications to distributed Unix platforms.

NMI will provide Sun customers with a variety of systems integration services, including requirements analysis, network design and implementation, application development support and facilities management.

Software gives Unix users expanded database access

SQL employed to reach proprietary databases.

By Wayne Eckerson
Senior Editor

NASHUA, N.H. — Dharma Systems, Inc. this week will announce software that enables workstation users to employ SQL commands for accessing data from proprietary databases running on a variety of hardware platforms.

Dharma/SQL Network consists of client software for Unix workstations as well as server software that runs on all hardware platforms supported by Dharma/SQL Access, the firm's flagship product.

Dharma/SQL Access converts SQL commands from host-based applications to commands understood by a proprietary database. It resides on the same machine as the target database and currently works in Digital Equipment Corp. VAX/VMS and various Unix server environments.

Dharma/SQL Network enables firms using SQL applications on workstations or local-area net servers to access the proprietary databases supported by Dharma/SQL Access. This will allow Dharma/SQL Access users to downsize from host-based systems to client/server platforms in order to get better economies of scale, company officials said.

Dharma/SQL Network enables SQL applications to pull data from multiple databases. Currently, Dharma Systems customers must log on and off each system to access data on multiple databases.

Also, the new software enables users to build SQL applications with new fourth-generation language tools, which make it easier for users to write applications for client/server platforms.

Dharma Systems plans to add support for DOS/Windows clients and Microsoft Corp.'s Open Database Connectivity standard to Dharma/SQL Network by year end.

Dharma/SQL Network costs between $25,000 and $50,000 for a source license and between $100 and $200 per user for royalty payments, depending on the user's configuration.

WordPerfect users to get access to top databases

By Timothy O'Brien
West Coast Bureau Chief

RALEIGH, N.C. — Of vital interest to users today is finding a way to access and integrate information from corporate databases into the most commonly used desktop applications.

That task may get a bit easier with help from Pioneer Software, Inc., based here, and WordPerfect Corp., which will work together to incorporate Pioneer's database access technology into future Microsoft Corp. Windows versions of WordPerfect, the popular word processing program.

Pioneer's software will give WordPerfect users direct access to 14 leading databases including IBM's DB2, Oracle Corp.'s Oracle Server and Sybase, Inc.'s SQL Server.

"With Pioneer's multidatabase technology, future WordPerfect releases will allow integration of information from almost any major database system," said Dave Moon, vice-president of WordPerfect, based in Orem, Utah.

The announcement builds on WordPerfect's new strategy of teaming with other vendors to provide additional capabilities for its word processor, which has long been the favorite of corporate users.

Recent agreements demonstrate WordPerfect's efforts to extend its product's role beyond simply word processing. Those ventures include teamings with Novell, Inc. to provide a NetWare Loadable Module version of WordPerfect; with Adobe Systems, Inc. for additional font software; and now with Pioneer for its data access technology.

Pioneer's database access technology is incorporated in its query tool called the Q&E Database Library. This product pro-

(continued on page 27)

Shakeout looming

What the future holds for client/server application development tools

	1992	1995
Databases supported	A few different databases	Almost all databases
Clients supported	1 or 2 different user interfaces	At least 3 different user interfaces
Pricing	$30 to $50,000	$5,000 to $8,000
Number of major vendors	25	10
Total worldwide market size	$475 million	$2.6 billion
Product complexity	High/medium	Low

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Who will remain in client/server race?

Competition in market for development tools to result in thinning field of competitors, report says.

By Wayne Eckerson
Senior Editor

CAMBRIDGE, Mass. — The market for client/server application development tools is exploding, leaving customers to choose among a baffling array of products, each billing itself as a total solution to users' client/server development needs.

Neal Hill

But intense competition will shrink the current field of about three dozen vendors down to about 10 during the next three years, according to a new report from Forrester Research, Inc., based here.

Therefore, it is critical that users carefully evaluate the long-term viability of products — as well as their vendors — before standardizing on a product for developing client/server applications.

According to the report, the vendors that survive the impending shakeout will offer tools incorporating a fourth-generation language and support for multiple clients and databases. It also stated that those offerings will cost between $5,000 and $8,000.

In addition, the tools will incorporate a repository for managing data and objects and will provide a utility for designing applications or links to computer-aided software engineering (CASE) modeling tools.

While the report said it is still too early to predict the winners, it singled out several firms that are well positioned to succeed in the client/server tool market.

These companies already have tools with many of the key characteristics cited by Forrester and have the financial resources to acquire smaller firms or technologies needed to round out their offerings.

These firms include Easel Corp., Powersoft Corp., Gupta Technologies, Inc., Progress Software Corp., Uniface Corp., Cooperative Solutions, Inc. and various database vendors, such as Sybase, Inc. and Borland International, Inc.

The list also included traditional CASE vendors KnowledgeWare, Inc. and Andersen Consulting.

4GL vital

Neal Hill, one of the authors of the report, said client/server application development tools that do not incorporate a fourth-generation language will have a difficult time competing in the 1990s.

According to Hill, fourth-generation languages are gaining in popularity because they are easier to use than third-generation languages and they let develop-

(continued on page 27)

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Who will remain in race?

continued from page 25

ers build applications more quickly and less expensively than high-level CASE modeling tools.

"Most developers are saying they can't wait any longer [for CASE-based applications] and are turning to fourth-generation languages and rapid prototyping methods to get the job done quickly," Hill said.

He added that traditional CASE vendors will try to get a foothold in the rapidly growing client/server development market by acquiring smaller companies that offer front-end application development tools or other players with the right technology. Case in point: KnowledgeWare's recent acquisition of Viewpoint Systems, Inc., which makes a graphical user interface (GUI) screen-painting tool.

Hill expects that vendors of nongraphical tools, such as Progress, will try to acquire companies such as XVT Software, Inc. or Neuron Data Corp. that specialize in GUI development tools.

Survival tactics

To survive the shakeout, client/server development tools will need to support as many back-end databases as possible and at least three user interfaces. Hill said every tool will need to offer support for character-based, Windows and Unix interfaces.

One of the shortcomings of all tools on the market right now, the report said, is that they do not provide connections to many mainframe and minicomputer databases, which hold the bulk of corporate data in most companies.

Future tools will need to provide links to relational and nonrelational databases on corporate hosts, Hill said.

Overcoming shortcomings

The strength of Uniface's development tool, for example, is that it supports 24 back ends and six user interfaces. In contrast, database vendors generally offer front-end tools that only work with their own databases and support perhaps one or two user interfaces.

However, Hill said, most database vendors have recognized this shortcoming and are in the process of rolling out multiplatform development tools.

Hill added that another strength of Uniface is that it begins to meld the capabilities of CASE and fourth-generation language tools. Uniface has a data dictionary that has links to third-party CASE tools. These links enable users to take advantage of the best of CASE and fourth-generation languages.

One of the drawbacks of Uniface, however, is cost. The report predicts that most users will not see the value in paying $10,000 to $50,000 for a development tool, even if it offers extra capabilities.

The report predicts that the average price of tools will range between $5,000 and $8,000. Run-time licenses will cost between $1,000 and $3,000 per server. ▣

WordPerfect to get access

continued from page 25

vides Windows developers with a collection of Dynamic Link Libraries (DLL) that provide a common call-level interface for database access for any application or tool capable of calling a DLL.

Because the Q&E Database Library can be called from the macrocomputer, script or programming languages of any Windows product, applications such as WordPerfect for Windows can use this tool to directly retrieve and manipulate database information.

If WordPerfect provides a full implementation of the Q&E engine, WordPerfect for Windows users would be able to simultaneously access multiple databases or move data from one database system to another.

However, Scott Worthington, director of strategic relations at WordPerfect, said work is just getting under way and it is too early to tell how much Q&E functionality will be added into the next version of WordPerfect, expected sometime next year.

"The idea behind bundling the Q&E engine into WordPerfect is that we want to give users the ability to do SQL queries from WordPerfect and incorporate that data into word processing documents," explained Worthington. ▣

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

During the first six months of this year, the number of mergers and acquisitions in the information technology industry decreased to 227, down 23% from the 295 recorded during the first half of last year, according to Broadview Associates, a Fort Lee, N.J., mergers and acquisitions firm.

People & Positions

J. Morris Weinberg, chairman of the board and founder of **Fibronics International, Inc.,** last week said he will not stand for reelection as a director of the company at the shareholders' meeting in May. He will stay on with Fibronics, a company specializing in Fiber Distributed Data Interface, as a consultant for one year.

Gerald Riso was recently named president of the **Information Technology Requirements Council,** a group that oversees the **North American MAP/TOP Users Group.** Since February 1987, he has served as the nation's first associate director for management and chief financial officer within the Office of Management and Budget.

Cisco Systems, Inc., a Menlo Park, Calif., router vendor, has named **Donald LeBeau** vice-president of North American sales. He will be responsible for all direct and alternate channel sales of the firm's bridge/router and communications server products in the U.S. and Mexico.

(continued on page 32)

Team to develop standard for laptop LAN interface

New work group formed under the PCMCIA.

By Bob Brown
Senior Editor

IRVINE, Calif. — Ten leading LAN hardware, software and semiconductor vendors have formed a new industry group designed to help set standards for credit card-sized local-area network interfaces for portable computers.

The new Personal Computer Memory Card International Association (PCMCIA) Workgroup for LANs is a subset of the PCMCIA, which was formed to establish standards for add-on accessories for laptops. The PCMCIA mainly focuses on memory boards, but it is also developing standards for portable computer modems.

The Workgroup for LANs was organized by Standard Microsystems Corp. (SMC) and National Semiconductor Corp. Other vendors represented at the group's first meeting, held in July, include Advanced Micro Devices, Inc., Fujitsu America, Inc., Intel Corp., Novell, Inc., Proxim, Inc., Socket Connections, Texas Instruments, Inc. and Xircom.

The work group has established two goals: to provide physical, electrical and logical interface standards for PCMCIA LAN cards and to promote vendor adherence to these standards.

The standards work will largely revolve around finding the best form factor for the plug-in cards, said a spokeswoman for SMC, which plans to have such cards available next year.

Other issues being examined will include compatibility with operating systems, network operating systems and microprocessors.

Dataquest, Inc., a San Jose, Calif., market research firm, predicts that the market for Ethernet PCMCIA LAN adapters will reach three million units by 1995.

PCMCIA Workgroup for LANs roster

- **Advanced Micro Devices, Inc.**
- **Fujitsu America, Inc.**
- **Intel Corp.**
- **National Semiconductor Corp.**
- **Novell, Inc.**
- **Proxim, Inc.**
- **Socket Connections**
- **Standard Microsystems Corp.**
- **Texas Instruments, Inc.**
- **Xircom**

SOURCE: BBN COMMUNICATIONS CORP., CAMBRIDGE, MASS.
GRAPHIC BY SUSAN J. CHAMPENEY

INDUSTRY BRIEFS

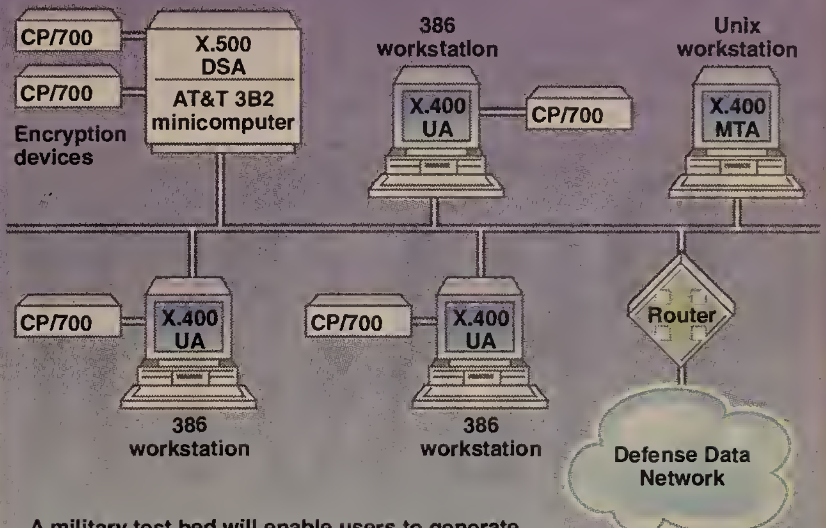
Cisco Systems, Inc. reported skyrocketing revenue growth for the fourth quarter, ended July 26, with sales of $110.7 million, up 95% compared to the corresponding quarter last year. Net income for the quarter was $27.2 million, compared to $13.22 million for last year's fourth quarter. The company posted $339.6 million in net sales, up from $183.1 million last year. Net income grew to $84.3 million, an increase from $43.1 million in 1991.

Windata, Inc. announced it has received $5.75 million in financing from three investment firms — Advent International Corp., Burr, Egan, Deleage & Co. and New Enterprise Associates. The funds will be used for the continued marketing and development of Windata's FreePort wireless local-area network products introduced last May.

Ascend Communications, Inc. recently announced it has formed a European subsidiary called Ascend Communications Europe, Ltd., which is based in Surrey, U.K. Ascend's European subsidiary will support European customers and distributors of Ascend's bandwidth-on-demand products.

(continued on page 32)

The Defense Message System test bed using the Message Security Protocol



A military test bed will enable users to generate messages with X.400 User Agent (UA) software and protect them using the Message Security Protocol and encryption devices. The protected messages will be routed across the Defense Data Network by an X.400 Message Transfer Agent (MTA). The test bed will include an X.500 Directory Service Agent (DSA) "electronic white pages" listing of users.

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: BBN COMMUNICATIONS CORP., CAMBRIDGE, MASS.

Military to test secure X.400 E-mail system

BBN to install test bed using MSP, which could become an OSI standard for X.400 protection.

By Ellen Messmer
Washington Correspondent

CAMBRIDGE, Mass. — This November at 13 military sites nationwide, BBN Communications will install an X.400 messaging system test bed that uses the Message Security Protocol (MSP) to protect messages.

The messaging system, which about 100 users in the U.S. Army, Navy and Air Force will test-drive for a year, is the planned prototype for the Defense Message System (DMS). It will be the first major implementation of MSP, which could ultimately become the Open Systems Interconnection standard for X.400 protection.

"MSP, when it's used in conjunction with cryptography, provides a very secure messaging system," said Susan Albert, program manager for trusted systems at BBN Communications, a division of Bolt Beranek and Newman, Inc.

MSP was developed by a dozen vendors under the Department of Defense's Secure Data Network System Program, which asked members of the industry to come up with a new protocol for OSI-based security, Albert said. MSP fulfills the need for a security specification in OSI, she added.

The protocol interacts with the X.400 user interface to add mandatory access control, confidentiality, and sender and recipient nonrepudiation in X.400 messages.

The Defense Department has planned DMS as a state-of-the-art messaging system to replace the current means of sending secured military messages, the old store-and-forward Automated Defense Information Network.

> The messaging system is the planned prototype for the DMS.

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The DMS X.400 Message Handling System and X.500 Directory Services prototype to be installed by BBN Communications will allow users on local-area nets at military locations in Alabama, Arizona, Ohio and the Washington, D.C. area to access and transmit messages across the Defense Data Network, the military's X.25 net (see graphic, this page).

(continued on page 32)

Military to test X.400 E-mail system

continued from page 31

For the year-long DMS trial, BBN Communications will equip each user's workstation with its MSP software and commercial off-the-shelf Retix X.400 software.

Users will create messages using the X.400 User Agent software. That software will then be intercepted by the MSP software, which adds access control to the message. MSP will then automatically route the message to an attached BBN Communications CP/700 peripheral cryptographic device for encryption of the message.

The protected message will be sent across the LAN to an X.400 Message Transfer Agent, which runs on a Unix workstation acting as a server.

Once the X.400 portion of the DMS test bed is up and running, BBN Communications will add X.500 Directory Services to give users "electronic white pages" on the network. An AT&T 3B2 minicomputer running Retix X.500 software will likely be recruited as the server.

Albert said the test bed could be run without X.500 because each workstation would be able to store information on a certain number of users, but BBN Communications expected to add X.500 in late 1992, with everything up by next February.

"The basic reason for the test bed is so users can try out the secure messaging system and go back to the Defense Information Systems Agency, the authority for the DMS, and tell them what they like and don't like about it," Albert said. "What will come out will be clear requirements for what the eventual security will be."

There are now two versions of MSP: Version 1.0, largely complete, allows security features to be added to a single X.400 message, while Version 2.0, still under development, extends the basic capability to include support for large mailing lists. MSP could potentially be used in the commercial sector, and several vendors are interested in submitting MSP for review as an OSI standard, Albert said.

> Several vendors are interested in submitting MSP for review as an OSI standard, Albert said.
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Establishing security for X.500 is also a Defense Department concern, she said, noting that under a separate contract granted by the National Security Agency PlayList program, AT&T and BBN Communications are partnering to develop a multilevel secured X.500 system. "We're developing a secure X.500 server," Albert said. ◘

Industry Briefs

continued from page 31

Systems integrator **Network Management, Inc. (NMI)** and computer vendor **Sun Microsystems Computer Corp.** recently signed an agreement to jointly market their services to the financial and manufacturing industries.

Under the deal, NMI has agreed to provide companies using Sun computer workstations with applications development support and facilities management.

The **National Institute of Standards and Technology (NIST)** and the **Industrial Technology Institute (ITI)** of Ann Arbor, Mich., recently announced a two-year, $600,000 cooperative agreement project to develop concurrent-engineering management tools based on the merging international Standard for the Exchange of Product model data.

The NIST-ITI program is intended to help companies identify organizational and technical barriers to exchanging data with their suppliers. ◘

People & Positions

continued from page 31

Kevin Mills, chief of the systems and network architecture division at the **National Institute of Standards and Technology (NIST)**, has announced that he will be taking a two-year leave of absence from the government agency beginning next month to pursue an advanced degree.

Richard Linn, who is currently associate director of NIST's computer systems laboratory, will assume the position of acting division chief during the two-year period. ◘

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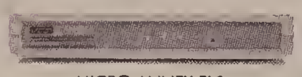
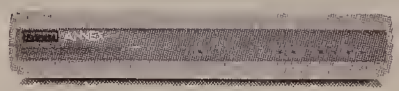


MICRO ANNEX ELS
TERMINAL SERVER



ANNEX THREE
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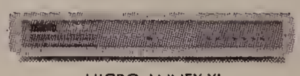

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Worth Noting

"If you know what you're doing, networking is not hard. The hard part is getting to know what you're doing."

G. David Caldwell
President
GDC Associates
An independent consultancy
in Pottstown, Pa.

Manager Minutes

The **X.400 Application Program Interface Association** has issued a plea for participation in its effort to devise a standard messaging API.

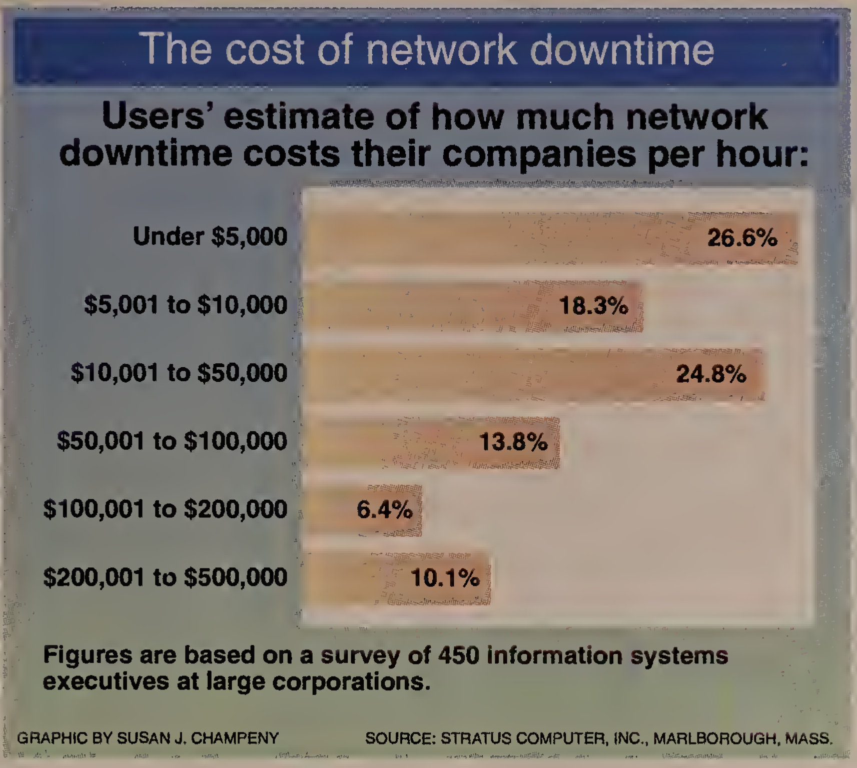
The vendor group made its pitch for a Common Mail Call set, as it refers to the APIs, at a meeting of the **Electronic Mail Association** in Seattle. The Common Mail Call set will help speed development of mail-enabled applications that can work with a variety of mail systems.

The **American Society for Training and Development (ASTD)** will hold its sixth annual National Conference on Technical and Skills Training Oct. 14-16 at the Cobo Conference/Exhibition Center in Detroit.

The conference will feature more than 130 sessions on topics such as integrating training and quality, as well as managing technical training in the 1990s.

The conference will sponsor a variety of speakers, including William Wiggenhorn, president of Motorola, Inc.'s Motorola University and vice-president of training and education at the company. Wiggenhorn will address the topic of tying training to business needs.

For more information, call ASTD at (703) 683-7256.



Figures are based on a survey of 450 information systems executives at large corporations.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: STRATUS COMPUTER, INC., MARLBOROUGH, MASS.

Video-based courses turn offices into classrooms

Keep workers informed without seminar costs.

By Joanne Cummings
Senior Writer

SUNNYVALE, Calif. — Keeping staff up to speed on the latest advances in networking can be a difficult endeavor. Traditional educational seminars and courses usually require travel, racking up expenses and stretching already shorthanded staffs to their limit.

As a result, many network managers are looking for video-based training courses. Video courses, such as those offered by TCT Technical Training, located here, give managers a flexible, cost-effective way to keep themselves and their staffs up to date.

"It's pretty cheap in comparison to sending someone to a three-day seminar for $1,000 or $1,200," said Mike Cordo, director of information processing and telecommunications at American Express Travel Related Services Co. in New York. He said American Express has been using courseware from TCT for about two years.

TCT's training tapes average about $3,000 per course. Cordo contends that price is reasonable since the purchased tapes are always on hand for people who want a refresher or for new hires who need to be brought up to speed on a technology.

TCT's curriculum ranges from a basic introduction to data communications to more advanced courses on IBM's Advanced Peer-to-Peer Networking. The courses come complete with VHS-compatible video tapes and course booklets. The booklets are designed to be reproduced so that many staff members can take the same course at no extra charge.

Because the courses are video-based, staff members can learn at their own pace and are not tied down to specific class times.

"You do lack the interaction that you would have with an instructor, but you're not a slave to a schedule and you're not a slave to an instructor," Cordo said.

> "It's pretty cheap in comparison to sending someone to a three-day seminar," Cordo said.
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At American Express, all employees are required to take at least six days per year away from their day-to-day duties for education. "The videotapes work well, especially since [staffers] don't have to leave the building or disappear for a week," he said. "We try to give them time where they're not going to be interrupted, but if an emergency does come up, they can handle it."

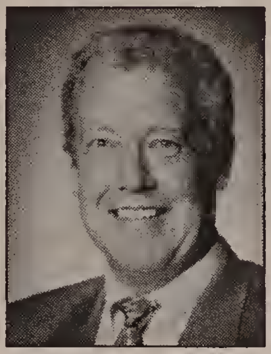
MANAGEMENT INSIGHTS

BY PHIL EVANS

The art of retaining quality workers

Minimizing employee turnover is a primary goal of all network managers. After all, the current staff already knows the technical, political, corporate and practical aspects of their job and company.

But the career path for long-term employees is generally limited. The only place they can go is into their boss's job, putting several people into competition for a position that the incumbent has no intention of vacating. With most everyone competent enough to secure a higher position at another firm, how do you keep employees motivated and content?



First, adopt a positive attitude toward your staffers. Take the time to get to know them personally by showing an interest in their professional aspirations, family situations and hobbies. Such interest makes people feel special.

Next, give them the freedom to use their talent and training to perform their job in their own way. Obviously, you have to know them well enough to determine how much freedom they can work well within, but that doesn't take long, and the benefits far outweigh any related effort.

Finally, when a good performance culminates in success, share the glory and rewards with the staff. Recognize their efforts with a celebration, personalized letter of commendation or another type of acknowledgment.

The key to success in this endeavor is self-confidence. Self-confident managers are not intimidated if the people who report to them know more than they do about a particular topic.

On the contrary, they seek out and surround themselves with the best talent they can find. Given the opportunity, these individuals will produce results that make the manager look good while fulfilling their own personal goals.

In addition, be flexible. Demanding that everyone be at their desk sharply at 8 a.m. but giving no credit for working until midnight or on the weekend will hardly engender a sense of staff loyalty. Professionals will do what it takes to get the job done, so cut them some slack. Allow them an afternoon off to play golf, be with their family or conduct personal business. Your staffers have the same needs as you.

Another way to keep long-term employees interested is to let them represent the company at conferences, seminars and association meetings. Many people thrive on such opportunities. They learn from the presentations and interaction with other participants, and they come back to the job with good ideas and enthusiasm. More importantly, they feel the boss trusts them to represent the company.

Finally, try to foster team spirit. Inevitably, situations will crop up in which one group under your direction is more stressed than another. Move staff members around to assist groups that are under the gun. This provides breadth and depth to the staff and produces team spirit. Professionals respond well because they are learning while producing positive results.

Staff turnover is sure to decrease when employees feel trusted enough by their manager to work within their own styles and when they are treated with respect and receive recognition for good performance.

Evans is a telecommunications consultant at Perot Systems Corp., a systems integration and outsourcing firm in Dallas.

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of the future, which premises
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USER VIEW

BY DOUGLAS WELCH

Network managers in need of resource management tools

Network managers need a standard system for managing all the resources that make up their nets — not just the hardware. Such a system would give them centralized control of local-area network user accounts, gateway access and other services.

But no standard has emerged to give network managers the same type of control over these administrative tasks as the Simple Network Management Protocol has offered in monitoring and controlling network hardware. And vendors' lack of effort to develop such a standard is distressing.

Network managers need to pressure vendors to begin laying a foundation for a standard account and services management system. Such a system is critical, and it will take years to develop even the most basic version.

In the meantime, network managers must continue using one system to maintain server accounts, another for mail accounts and another for controlling access to net devices. This means end users must fill out separate forms when requesting net services, including one listing their logon name and password, another listing the gateways they wish to access and yet another requesting entry into an electronic mail directory.

> Troubleshooting even minor problems using separate systems can be a nightmare.
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Managers then need to enter this information into separate systems, which means they often enter redundant data such as the user's name and LAN address. Users should be able to specify required services on one form, and managers should only have to enter that information once.

Currently, troubleshooting even minor problems using separate systems can be a nightmare. For example, a network manager would have to use one system to verify an active mainframe account for a user complaining about the inability to access a host via a gateway. Another system must be used to make sure the user has gateway access rights and still another to make sure the gateway is connected to the host.

Why can't one system gather this data, much the same way SNMP-based systems gather data from disparate net devices?

The problems caused by this lack of centralized management add up to poor customer service ratings. Net managers who can't get their hands on the information they need or bury users in paperwork have a hard time proving the value of their services. Users quickly become annoyed when it takes three or four calls to get an account properly configured. And with each call, they become more convinced that the network group doesn't know what it is doing.

With a central administration system, net managers can quickly and easily generate new user accounts and improve their image. A central system also ensures that when a user quits or is terminated, all access can be easily revoked.

Network management is already out of control in most large companies, and the lack of a centralized administration system will be a major constraint on future network growth. Cooperation is needed from network managers as well as vendors to overcome this problem.

Welch is a support analyst for a major entertainment corporation in Los Angeles.

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Bob Brown — Industry Update
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14701 Bentley Square
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Phone: (703) 830-8138
Fax: (703) 830-7963

Caryn Gillooly — Local Networking
5423 Gladewright Drive
Centreville, Va. 22020
Phone: (703) 266-1537
Fax: (703) 266-1543

Senior Writers
Joanne Cummings — Management Strategies
67 Highgate Road
Marlborough, MA 01752
Phone: (508) 481-6061
Fax: (508) 485-5809
Maureen Molloy — Internetworks

Staff Writer
Skip MacAskill — Internetworks

West Coast Bureau
Timothy O'Brien
Bureau Chief/Enterprise Applications
Phone: (415) 771-3530

Margie Wylie
Senior Editor/Local Networking
2088 Union Street, Suite 2
San Francisco, Calif. 94123
Phone: (415) 771-4103
Fax: (415) 771-2817

Washington D.C. Bureau
Anita Taff
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Ellen Messmer — Industry Correspondent
National Place
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Washington, D.C. 20004
Phone: (202) 879-6752

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Network World
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(508) 875-6400
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Shearman & Sterling

EDITORIAL

IBM: Rethink licensing policy to ensure APPN's success

At a time when IBM ought to be doing everything in its power to ensure that other vendors embrace its Advanced Peer-to-Peer Networking (APPN), the company has created concern among hardware and software makers with its plans for licensing a key part of the technology.

Not only will vendors looking to build products that support APPN network node specifications have to license the patented technology directly from IBM, they'll have to do it at a price reportedly as high as $400,000. Compare that to the grassroots alternative TCP/IP.

APPN is Big Blue's best hope for bringing its venerable Systems Network Architecture into the distributed processing era. APPN is supposed to become the underlying transport facility of choice for multivendor nets.

But IBM has only a limited window of opportunity in which to make APPN a success, and broad industry support is vital.

The company has wisely opened to the industry its APPN end node specs, which define how to add APPN support to network end points such as client nodes. But its license plans for network nodes, which handle key routing functions, are a hard pill for vendors to swallow.

IBM says it must recoup its multimillion dollar investment in APPN. Fine. But trying to recoup it at nearly half a million bucks a whack may be shortsighted. Users are looking for a solution to their multiprotocol backbone problems, and each day's delay in achieving a critical mass of APPN products is another day in which they can rethink their commitment to SNA and embrace alternatives such as TCP/IP.

Losing control over the backbone means a loss of network hardware and software sales for IBM. Worse, IBM needs APPN to ensure a key role in the distributed net future for mainframes and their associated big ticket items such as disk drives, databases and operating systems.

In that light, IBM ought to rethink its APPN licensing plans. Knocking down any license barriers may be the fastest way for IBM to reap a big return on its APPN investment and ensure users have a wide choice of APPN products.

INTERNATIONAL NETWORKING

BY JOHN R. RYMER

Welcome to the brave new world of global networking

Global networking. We use the term so freely that you'd think building and running worldwide networks is as easy as falling off a log.

But just the opposite is true. Users face difficult problems in building global nets. A recent survey by Paul John Steinbart and Ravinder Nath at Memphis State University in Tennessee suggests that the dynamics of building and maintaining global networks is shifting away from technological concerns to organizational issues. (Survey results were reported in the March 1992 issue of the University of Minnesota's *MIS Quarterly.)*

According to the survey, users rank the ability to obtain foreign carrier facilities that can approach the efficiency and functionality of U.S. services as the top issue in building worldwide networks. Running a close second was inadequate circuit speeds outside the U.S.

However, the third top concern shows that users are realizing the need to solve thorny corporate organizational issues when building a global net.

These organizational issues will become even more important as technical concerns are overcome. While the survey did not address how quickly users expect to start obtaining better circuits overseas, the situation should improve dramatically over the next two years. Nations with traditionally poor telecommunications networks, such as those in the Pacific region, are investing billions of dollars in hopes of catching up with more developed countries.

Once that happens, users will be left to create an organization for conducting business globally and a standard technology strategy to match that organization. But achieving that won't be easy.

Survey respondents cited the resistance their overseas offices show toward the creation of worldwide corporate technical standards as an impediment to building global networks.

Multinational companies imposing consistency throughout their worldwide branches can apply volume purchasing power to reduce the cost of net facilities and cut training and support costs by reducing the number of different products they deploy.

But to those running an overseas branch, acquiescing to corporate sameness clashes with the need to distinguish their operation in competitive markets.

Opposition to worldwide standards is an outgrowth of the trend to decentralize.

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Opposition to worldwide technical standards is an outgrowth of the emerging trend among multinational corporations to decentralize. Giving autonomy to overseas manufacturing, marketing and sales operations may help those branches compete more effectively for customers, but it also feeds a desire to be free from corporate bureaucracy.

Even with a worldwide technical standard, some multinational firms realize that the network architectures and approaches learned in the U.S. need to be modified when they are transferred overseas. Organizations that decentralize find that overseas branches have their own way of dealing with customers and their own legal and political restrictions concerning information flow. U.S. systems designers don't have to deal with issues such as transborder information flow restrictions, but those overseas do.

Decentralization makes the issue of adopting standards more important but, at the same time, demands a minimalist approach. The more infrastructure standards, such as tapping X.25 and the Transmission Control Protocol/Internet Protocol as backbone protocols, the better. However, the fewer corporate standards that impede freedom to satisfy customer needs, the better.

A good example of this is the current rage over adopting a corporate standard for user interfaces worldwide. This policy can force an unfamiliar model on overseas workers. A user interface that helps U.S. workers become more productive may not fit the way overseas staff is accustomed to working.

As a result, adopting a worldwide corporate user interface standard could force overseas branches to retrain workers. If they are instead free to choose their own user interface, that retraining time could be spent winning customers.

This decentralization trend has thrown a pipe bomb into the well-considered global network plans of many user organizations. Few have mastered the new balance between central corporate values and the needs of overseas branches.

Understanding these issues is important to the progress of stable, highly functional distributed computing infrastructures that span the globe.

Welcome to the brave new world of global networking! ◻

Rymer is vice-president of the Patricia Seybold Group in Boston and editor in chief of Patricia Seybold's Distributed Computing Monitor.

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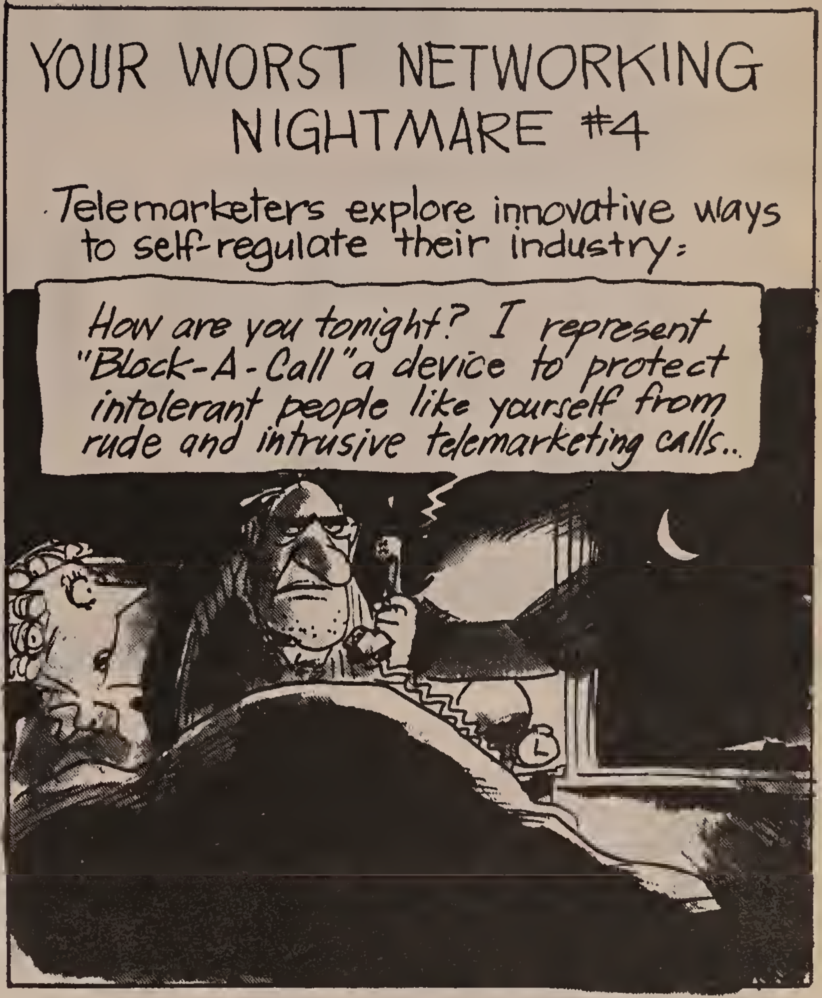
TELETOONS

BY FRANK AND TROISE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LETTERS

Bad business practice

After a dozen years with vendor organizations, I think it is absolutely unconscionable for a vendor to take subversive action against a customer — paying or not — as described in your article "User learns tough lesson in contracts" *(NW,* Aug. 3).

Apparently some vendors have never heard of reputable business practices, and this is certainly a disreputable method of handling an accounts payable problem.

Holding your customers hostage is hardly a basis for a long-lasting business partnership. Every company goes through financial ups and downs. Reputable vendors understand this and work with their customers to ensure their long-term viability and success.

This type of business is plain extortion. It's actions like this that cause users to view vendors with low regard. Boo. Hiss.

Lynne Gregg
Free-lance writer
Seattle

Automatic dialback

Your recent article "User learns tough lesson in contracts" *(NW,* Aug. 3) gave your readers several commonsense procedures that shops with remote service agreements should follow. One that was not covered — but one that I have seen used very successfully — is the use of automated dialback from the customer to the service provider.

Automated dialback provides a number of benefits for both the service vendor and the customer: improved security for the customer since the

(continued on page 45)

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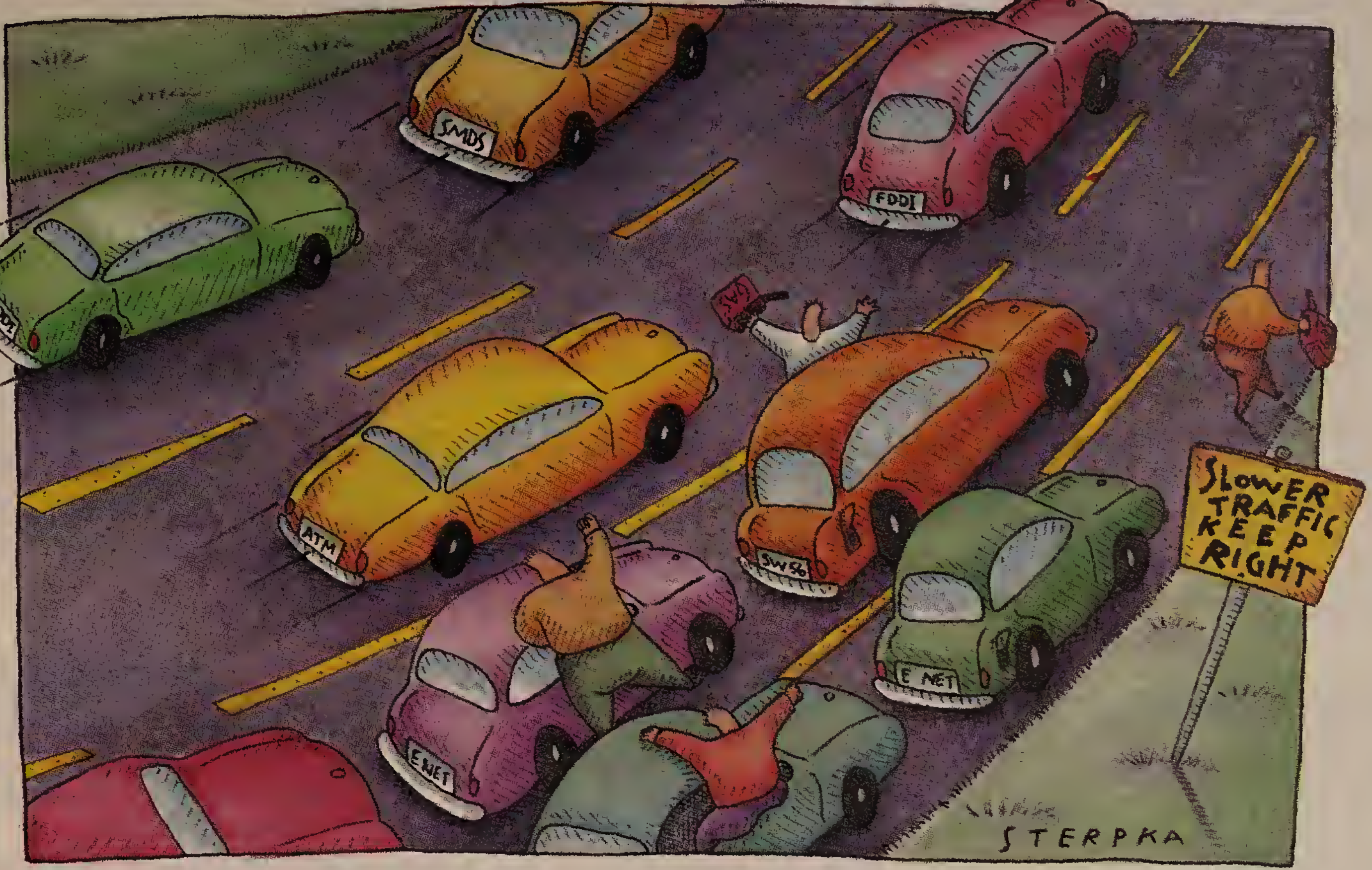
Frame relay, SMDS and ATM may ease traffic jams, but users should examine the implications of each.



Widening network highways

By ERIC SMALLEY

A few short years ago, net managers believed Ethernet and token-ring backbones, switched 56K bit/sec circuits and even high-speed channels on T-1 lines had ample capacity to link local-area networks. After all, users back then were just swapping simple electronic mail messages and small text files.

Today, however, some pioneering users are exchanging multimegabit image files, tapping into remote data bases to complete on-line transactions that require rapid response time and distributing new versions of software over internetwork links. Internetwork links put in place several years ago cannot support the increased traffic generated by these new applications.

As if the strain these applications put on internetworks is not enough, even more bandwidth-hungry applications are coming down the pike, threatening to bring traffic to a standstill. The list of these bandwidth hogs is headed by multimedia applications that mix text, graphics, images and video from multiple sources on a workstation screen.

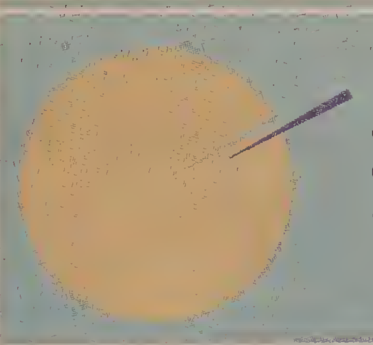
The increased demands these applications place on internetworks is forcing users to seek out high-speed internetworking alternatives.

Clearly, 100M bit/sec Fiber Distributed Data Interface backbone networks can provide oodles more bandwidth than Ethernet or token ring, and have been around for some time now. But while FDDI smashes the geographic and speed boundaries of Ethernet and token ring, it is still really just a campuswide solution (see "Don't overlook FDDI as option," page 44).

What users are looking for is a way out of their wide-area network bandwidth bind. They are beginning to examine high-speed WAN technologies such as frame relay and Switched Multimegabit Data Service (SMDS) to satisfy internetworking demands. Both frame relay and SMDS promise to shuttle data packets or cells between LANs at full T-1 or even T-3 speeds.

Products enabling users to build private frame relay networks and public frame relay services are becoming widely available while SMDS products and services are now emerging.

Just as users have begun sorting through those high-speed internetworking options, hype over a relatively new technology, Asynchronous Transfer Mode (ATM), is reaching a shrill pitch. Originally designed as the transport layer for Broadband Integrated Services Digital Network, ATM is a cell-switching technology that is expected to dramatically alter the current concept of internetworking.



Only 1% of LAN interconnection applications require wide-area connections above T-1 transmission rates, according to a November 1991 study by CIMI Corp.

Specifically, the technology's proponents envision a future in which ATM will be used to link desktop devices to LAN hubs, which in turn will use ATM to spread data throughout campus networks, across public carrier nets and around the globe at gigabit speeds (see "ATM to the desktop and beyond," page 40).

However, celebrations heralding the arrival of the 21st century will be over long before this grand vision is realized. It will take three or four years for ATM equipment to emerge and even longer for carriers to start offering ATM-based services.

In the meantime, users looking for increased bandwidth should closely examine frame relay and SMDS in order to figure out which one best suits their needs while keeping an eye on migrating to ATM later. Alternatively, users can stick with what they have today and begin planning for ATM.

Having a good grasp on how the various technologies work and what type of applications they best support will go a long way in helping make that decision.

The big three factors

The need for high-speed internetworking can be determined if any one of three conditions exist, says Tom Nolle, president of CIMI Corp., a consulting and market research firm in Voorhees, N.J.

The most obvious is if the size of the internetwork grows so large that existing links can no longer handle the traffic. Almost every internetwork is anchored by a continuous bit rate service,

(continued on page 40)

SMDS and frame relay deployment through 1993

Company	Trial location and completion date		Deployment location and availability		Price	
	SMDS	Frame relay	SMDS	Frame relay	SMDS	Frame relay
Ameritech	Michigan: 3Q; Chicago: 4Q	Michigan: 3Q	Detroit, Chicago: 4Q; Indianapolis, Milwaukee, Cleveland, Columbus, Ohio: 1H '93	Detroit: 4Q; Indianapolis, Milwaukee, Cleveland, Columbus: 1H '93	TBD	TBD
Bell Atlantic Corp.	Philadelphia: Complete	TBD: 1Q '93	Philadelphia, Pittsburgh: Now*; Washington, D.C., Northern New Jersey: 4Q; Baltimore, Harrisburg, Pa., Charleston, W.Va., Trenton, N.J., Norfolk and Richmond, Va.: 1993	Philadelphia, Pittsburgh, Washington, D.C., Northern New Jersey, Baltimore, Harrisburg, Charleston, Trenton, Norfolk and Richmond: 1993	$550-$600/month, $1,000 installation fee per line	TBD
BellSouth Telecommunications	Atlanta, Birmingham, Ala., Nashville: Ongoing	TBD: TBD	Atlanta, Charlotte, N.C., Nashville, Miami: 4Q -1Q '93	Atlanta, Charlotte, Nashville, Miami: 4Q-1Q '93	TBD	TBD
GTE Telephone Operations	Los Angeles area: 3Q	Research Triangle Park, N.C.: Complete	Los Angeles: 3Q; Tampa, Fla., Everett, Wash.: 1Q '93; Raleigh-Durham, N.C., Dallas, Honolulu, Portland/Beaverton, Ore.: 3Q '93	TBD: 4Q '93	$700/month, onetime $1,000 charge; $575/month, onetime $25 charge if user obtains access line from GTE	TBD
Nynex Corp.	Marlborough, Mass., Manchester, N.H.: 1992	Eastern Mass.: 1992	New York, Boston: 1993 (tentative)	Downstate N.Y.: Now; Eastern Mass.: 3Q	TBD	56K bit/sec: $67/port; T-1: $985/port
Pacific Bell	Los Angeles area: 3Q; Palo Alto and San Ramon, Calif., White Plains, N.Y.: Complete	Pasadena, Gardena, San Francisco, San Ramon and Berkeley, Calif., Denver: Complete	San Francisco Bay area, Los Angeles area, Orange County area, Ventura area, Riverside area, Sacramento area and San Diego area, Calif.: 3Q	San Francisco, Los Angeles, San Diego, Sacramento: 1H '93	$600/month, $375 installation charge; unlimited usage within service area	TBD
Southern New England Telephone Co.	New Haven, Conn.: 4Q	TBD: 4Q	Hartford, Bridgeport, New Haven and Stamford, Conn.: 2H '93	Hartford, Stamford, Bridgeport and New Haven: 2H '93	TBD	TBD
Southwestern Bell Telephone Co.	Houston: 4Q	Interoperability test with Nynex and WilTel, technical test between 2 St. Louis labs, internal LAN trial: 1992	TBD	Dallas, Fort Worth, San Antonio, Austin and Houston, Texas, St. Louis and Kansas City, Mo., Oklahoma City and Tulsa, Okla., Little Rock, Ark., Kansas City, Kan.: 2H	TBD	56K bit/sec: $170/month; 384K bit/sec: $295/month; 1.536M bit/sec: $850/month
US West, Inc.	Minneapolis, Denver: Ongoing	Minneapolis/St. Paul, Minn.: Ongoing	Minneapolis/St. Paul, Denver. 3Q; Seattle:1Q '93	Minneapolis/St. Paul, Omaha, Neb., Denver: Now; Phoenix, Salt Lake City, Seattle: 3Q; Boise, Idaho, Des Moines, Iowa, Albuquerque, N.M.: 4Q; Portland, Ore.: 1992 on individual case basis	To be filed Aug.: $115-$766/month for access link, $750 installation charge; $493-$900/month usage	56K bit/sec: $75.90-$227.10/month, $29/month for access link; 1.5M bit/sec: $230-$578/month, $117/month for access link

* Pre-Switched Multimegabit Data Service currently available; full service available in 1993.

H = Half
Q = Quarter
TBD = To be determined

SOURCE: *NETWORK WORLD*

(continued from page 39)

Nolle says. These networks transmit a high-speed data stream formed by aggregating many low-bandwidth applications that generate predictable amounts of traffic between specific devices. Because traffic is predictable, users can fix the internetwork link speed and set fixed routes between devices.

As the number of LAN devices increases, so does the amount of predictable traffic. In this case, the speed of internetwork links must go up or the additional traffic will cause delays.

The problem becomes more complex when the internetwork supports distributed applications that require quick response time. Distributed applications tend to confound fixed-rate network configurations because they generate unpredictable traffic flows, according to Nolle.

"As we move into a distributed information environment, we lose these predictable routes," he says. When distributed applications that typically generate multiple packet transmissions share bandwidth with other internetwork traffic such as file transfers, throughput rates drop as the packets are interspersed with other forms of traffic and response time goes up.

Distributed applications require internetworking services that are high-bandwidth and that do not consume private network resources or cost anything when they are not in use, Nolle says. SMDS, frame relay and ATM are appropriate technologies for this kind of traffic because they either establish virtual circuits that ensure all packets are sent at once or more quickly intersperse the packets with other traffic.

However, the need for this kind of network is still relatively limited. Distributed applications — in which applications on different devices communicate — comprise only about 2% to 3% of all applications, Nolle notes. The remainder follows the terminal-to-host model, where an end node interacts with an application running on another device.

"There doesn't seem to be any way a massive change in application characteristics will happen in the near term, particularly in the absence of [applied] distributed computing architectures," Nolle says. Those changes should start affecting user networks in 1994 and 1995, he adds.

The addition of voice and video traffic can also drive the need for higher speed internetwork services. Voice and video generate steady and timed information flows. As such, voice and video cannot tolerate any significant variation in throughput. This type of traffic is most suited to ATM networks, which break voice and video into small cells that can be quickly switched through the network, according to Nolle.

The way voice and video will most likely be added to internetworks is through the use of multimedia applications, which account for an insignificant portion of corporate network applications today, Nolle says. By most accounts, that will change in five years as multimedia applications become more widespread. According to current vendor planning, ATM products and services should be on the market within that five-year period.

Different means to same end

While frame relay, SMDS and ATM can provide the bandwidth needed to support increased WAN internetworking traffic, each technology uses a different approach to achieve the same results.

Frame relay, for instance, provides a means for efficiently moving packets containing up to 4K bytes of data between LANs over wide-area links; it is really just an

ATM to the desktop and beyond

Adaptive Corp.'s introduction last month of a local Asynchronous Transfer Mode (ATM) switch and network interface card for Sun Microsystems, Inc. SPARCstations marked the first step in what many are calling a revolution in networking.

At first, ATM was seen as a wide-area communications technology. But it has landed in local-area networking first.

Users will be able to attach LAN devices to an ATM switch via a dedicated link in a star topology. The ATM switch will then pass traffic between devices.

The arrival of ATM in the LAN environment signals that the era of shared-media LANs is coming to an end. It also signals the possibility of profound changes throughout nets worldwide.

Today's shared-media LANs — such as Ethernet, in which each LAN device contends for network transmission time — are running out of bandwidth. They are also ill-equipped to handle real-time traffic, such as voice and video used in emerging multimedia applications. Bringing ATM switching into the LAN addresses both problems, according to Audrey MacLean, president of Adaptive.

If ATM permeates both the LAN and wide-area network environments, it will provide a common transport mechanism across both, overcoming many internetworking issues associated with connecting LANs over wide areas.

"ATM brings [with it] the probability of [creating] a single network technology that will provide connection from desktop to desktop across the globe," says Michael Howard, president of Infonetics Research, Inc., a San Jose, Calif.-based market research firm.

Although ATM makes this pie-in-the-sky vision more realistic, the process is likely to take at least 10 years.

Two key requirements to make ATM all-pervasive are cost and infrastructure.

In the LAN environment, ATM products have to become widely available and, more importantly, affordable.

Performance advantages are not enough to displace current LAN technology.

In the WAN, the infrastructure to support ATM must be complete before global ATM services can be offered. This means carriers must completely upgrade to the fiber-based Synchronous Optical Network, which will provide a transport vehicle for ATM that starts at 155M bit/sec.

It's unlikely ATM will penetrate the LAN or WAN environments enough to bring about the global electronic village ideal until well into the new millennium.

— Eric Smalley

interface specification defining how data can be passed between a LAN internetworking device, such as a router, and a switch. Frame relay does not specify use of a particular wide-area service. It can operate very efficiently over T-1 links. Some equipment vendors are experimenting with running frame relay over T-3 links.

As the successor to X.25, frame relay is connection-oriented and establishes permanent virtual circuits (PVC) between network devices that use addresses known as Data Link Connection Identifiers (DLCI). Frame relay can dynamically allocate bandwidth based on the amount of data being sent. This means full T-1 bandwidth can be used to support a single transmission, if need be. Though frame relay dynamically allocates bandwidth, users still have to assign each PVC a top speed that it cannot exceed.

On the other hand, frame relay's reliance on PVCs makes it more difficult to handle changes since DLCIs need to be added, deleted or changed as the number of nodes on the internetwork fluctuates. This makes frame relay less appropriate for interconnecting a large number of LANs or LANs that undergo frequent configuration changes.

Despite the large number of frame relay equipment vendors and planned service offerings from the carriers, frame relay is still in its infancy, according to Sunil Dhar, product manager for wide-area networking at Cisco Systems, Inc., a Menlo Park, Calif.-based router maker. Services from the carriers are just starting to become available, he says ("Frame relay leads the pack," *NW,* Feb. 3).

Nevertheless, frame relay could provide users with an upgrade path to ATM-based services because it is an interface specification, not a service. Frame relay defines how to pass data into a network switch, including ATM switches. So as carriers deploy ATM switches, frame relay equipment investment is safe.

Frame relay is being implemented by long-haul carriers, and it seems suited for long-distance transmissions. But users that need high bandwidth or do not need long-haul wide-area links might discover SMDS is the answer.

Designed by Bell Communications Research, SMDS is a metropolitan-area network service that regional Bell holding companies are expected to offer. As a high-speed public data service, SMDS will be used mainly for interconnecting users' local-area networks.

SMDS provides a connectionless service in which fixed-length cells of 53 bytes each are fed into a switch in the carrier's central office, which delivers it to the destination location. As a connectionless service, SMDS does not use virtual circuits. Instead, each cell in a multicell transmission is individually addressed.

Initially, SMDS is expected to operate at T-1, though it is expected to eventually operate at T-3 and could run as high as 155M bit/sec using Synchronous Optical Network (SONET) links.

As a connectionless service, SMDS is appropriate for interconnecting a large number of LANs that undergo frequent changes. But SMDS will likely be available only in major metropolitan areas for some time. Bell Atlantic Corp. has filed a tariff in Pennsylvania, while Pacific Telesis Group has filed in California and US West, Inc. has filed in Colorado and Minnesota.

Several other RBHCs are conducting SMDS trials. Southwestern Bell Corp. has been running SMDS trials for six months in the Houston area, for example.

Application profiles vs. internetworking technologies

Application	Traffic	Technology
Increased scale of data internetwork	Large amounts of aggregated traffic, steady average flow	Continuous bit rate (T-1, SONET)
Distributed computing architectures	Distributed traffic not backbone-oriented, bursts at high rates	SMDS, frame relay, ATM
Multimedia/voice and video	Timed flow with no tolerance for significant variation; high, steady rates but short durations	Real-time services (ATM)

SOURCE: CIMI CORP., VOORHEES, N.J.

While SMDS is a primary focus for local exchange carriers, they also plan to offer support for frame relay. The seven RBHCs along with GTE Telephone Operations outlined plans for rolling out SMDS and frame relay last spring (see chart, page 40).

SMDS can also provide an effective migration path to ATM. SMDS utilizes the same cell size as ATM and can be easily adapted as a service running over ATM.

ATM: The Future

While SMDS is a connectionless service,

(continued on page 43)

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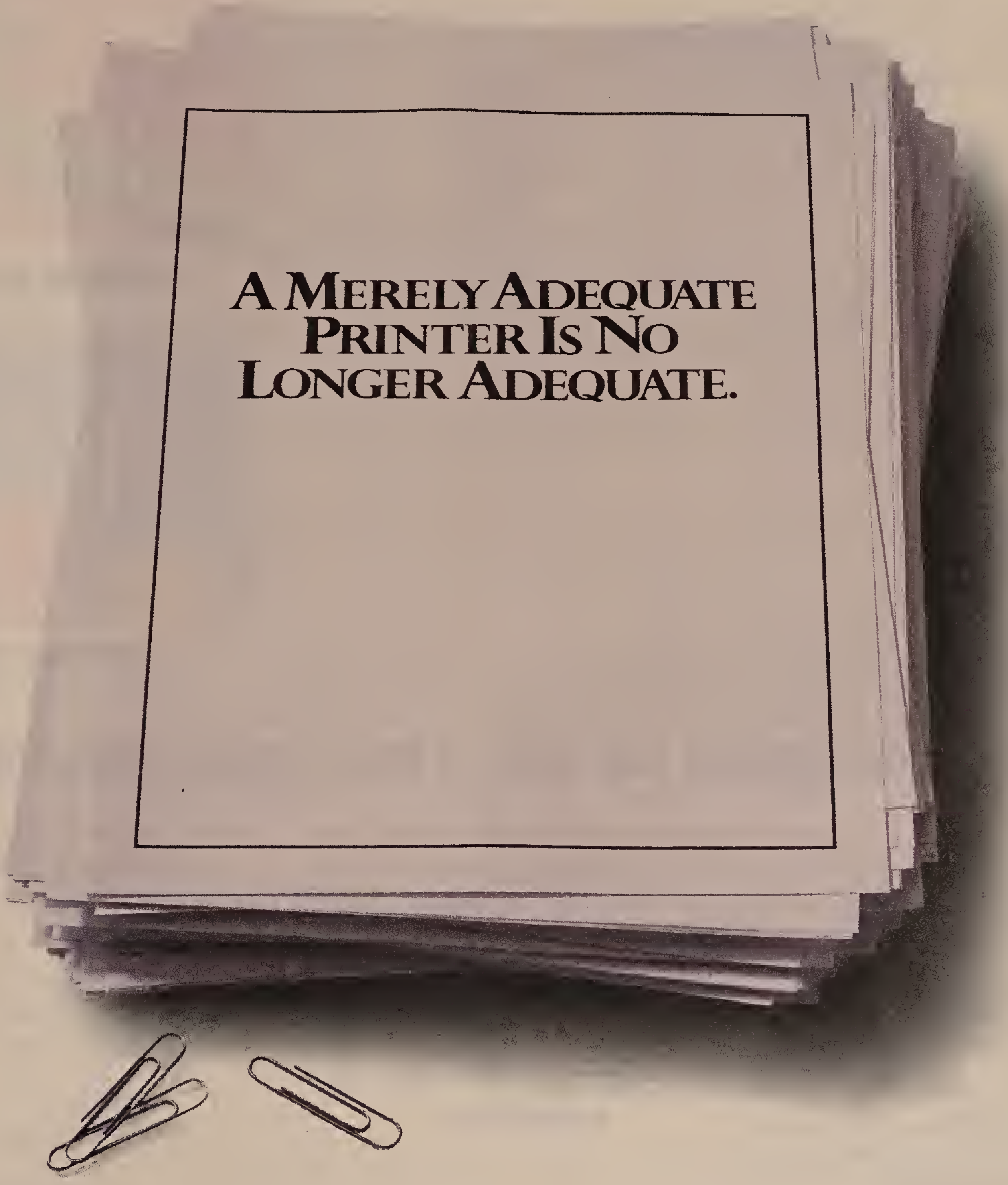

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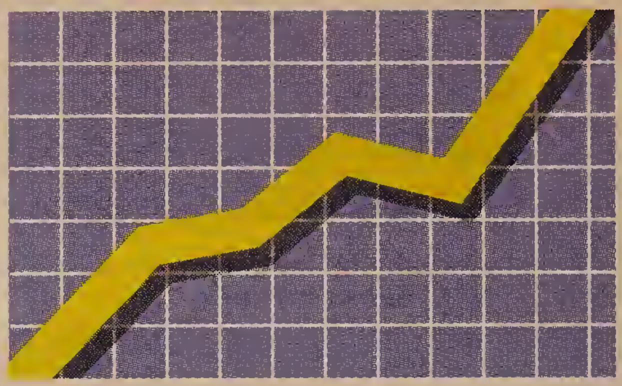
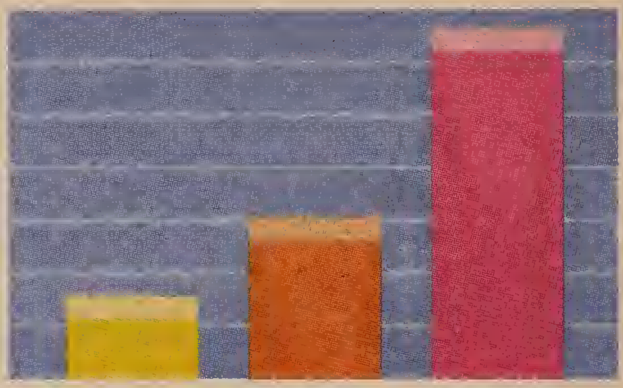


NETWORK PERFORMANCE

NETWORK RELIABILITY



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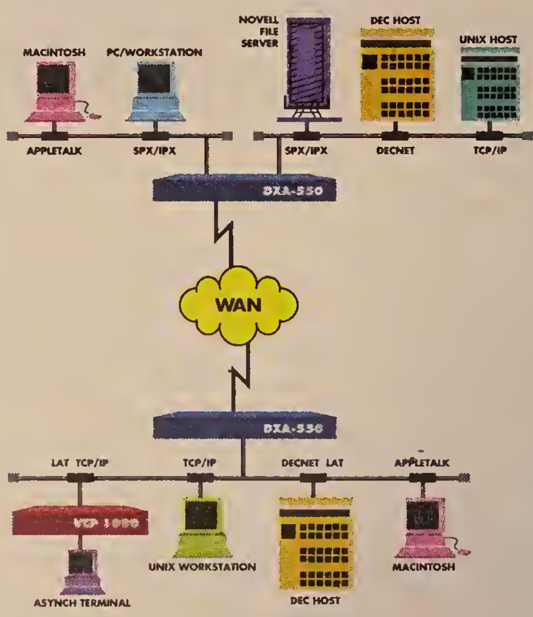

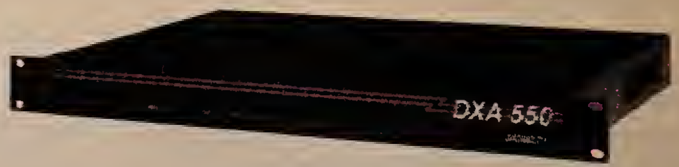

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Circle Reader Service #117

(continued from page 41)

ATM's cell-switching scheme utilizes virtual circuits and provides a means of carrying packet-based data and packetized real-time traffic, such as voice and video, on the same network. It has been defined by the Consultative Committee on International Telephony and Telegraphy as the transport for Broadband ISDN.

As part of Broadband ISDN, ATM was designed to operate over SONET. But it will be years before SONET is fully deployed by the carriers. Until then, ATM will operate at T-1 or T-3 speeds.

Each ATM cell is 53 bytes long, five bytes of which is a header that contains virtual circuit and virtual path identifiers. The virtual circuit is the stream between the source and destination devices. The virtual path is a physical link that provides transport for a collection of virtual circuits.

Above the ATM's cell-switching layer are adaptation layers that split various kinds of traffic into cells. One adaptation layer splits data into cells, and another splits voice and video into cells.

Next year, users will see everything from intelligent hubs with ATM backplanes to ATM switches being introduced, says Michael Howard, president of Infonetics Research, Inc., a San Jose, Calif.-based market research firm. But users won't start gobbling them up until 1994.

"I don't think there will be a huge migration when products come out in 1993," Howard says. "But in 1994, there will be quite a bit of campus backbones implemented with ATM." Public networks are not expected to fully support ATM until 1995 or 1996, he says.

For many users, support for ATM in public networks is an integral part of their migration plans.

"[Users] will do FDDI though '95," says Doyle Friskney, executive director of communications and network systems for the University of Kentucky at Lexington. "There won't be a public ATM switched network to support the private networks. There are going to be many issues [to consider] before I have to decide [on ATM migration plans], and the public network is the most important."

ATM will first show up in intelligent hub backplanes, where it will be used to link hubs together. Within the hub, ATM will interconnect different types of LANs, such as Ethernet, token ring and FDDI.

In addition, ATM will be added to routers. Cisco, for instance, plans to support ATM in its routers and is focused on developing an interface to ATM switches made by other vendors in the same way Cisco supports T-1 today, Cisco's Dhar says.

"With ATM, Ethernet is just a connection," says Sam Shuler, communications strategy manager for Texas Instruments, Inc. "FDDI should be the same way. Voice should be the same way."

TI is examining ATM closely. Its corporate network spans hundreds of remote sites and supports almost all of the company's nearly 60,000 employees. The company's network is not only large, it also carries heavy traffic loads. TI uses a couple of T-3 lines to connect sites in the Dallas/Fort Worth area, for instance.

"[Network] payloads are in the hundreds of megabytes," Shuler says. "We're shipping design programs [across the network], not just data.

"We've got two problems: No. 1 is infrastructure capacity at the site, campus and building level, and No. 2 is how to connect all of those," Shuler says. "Demand is increasing exponentially. It's putting a lot of pressure on our internetworking gear."

TI's ability to connect LANs at high speeds over wide-area links has been limited by the bandwidth of the carrier's current offerings, according to Shuler.

"For the last 12 to 24 months, that's been T-3," Shuler says. "That cap can't be there anymore. We've got LANs that can chew up 10M bits very quickly. It's been a rather frustrating experience."

However, it will be several years before TI or any other user can tap into ATM-based services. Currently, only two of the RBHCs, Southwestern Bell and Nynex Corp., have begun trials for ATM-based services. Both RBHCs are using ATM switches from Fujitsu America, Inc.

But one thing is clear: ATM will be used to link LANs. The question, which the Internet Engineering Task Force (IETF) is currently addressing, is how ATM will accomplish the task, says Doug Hunt, senior manager of technology development for BBN Communications, a divison of Bolt Beranek and Newman, Inc. Should ATM network addressing be handled the way a bridge currently works or like a router?

"There is a range of opinions," Hunt says. "The current IETF working document has some aspects of both. Some people support a routing function; others support internetworking units that look a lot like media access control-layer bridges."

The IETF's work, along with work being done in the vendor-backed ATM Forum, is addressing technical issues for supporting

(continued on page 44)

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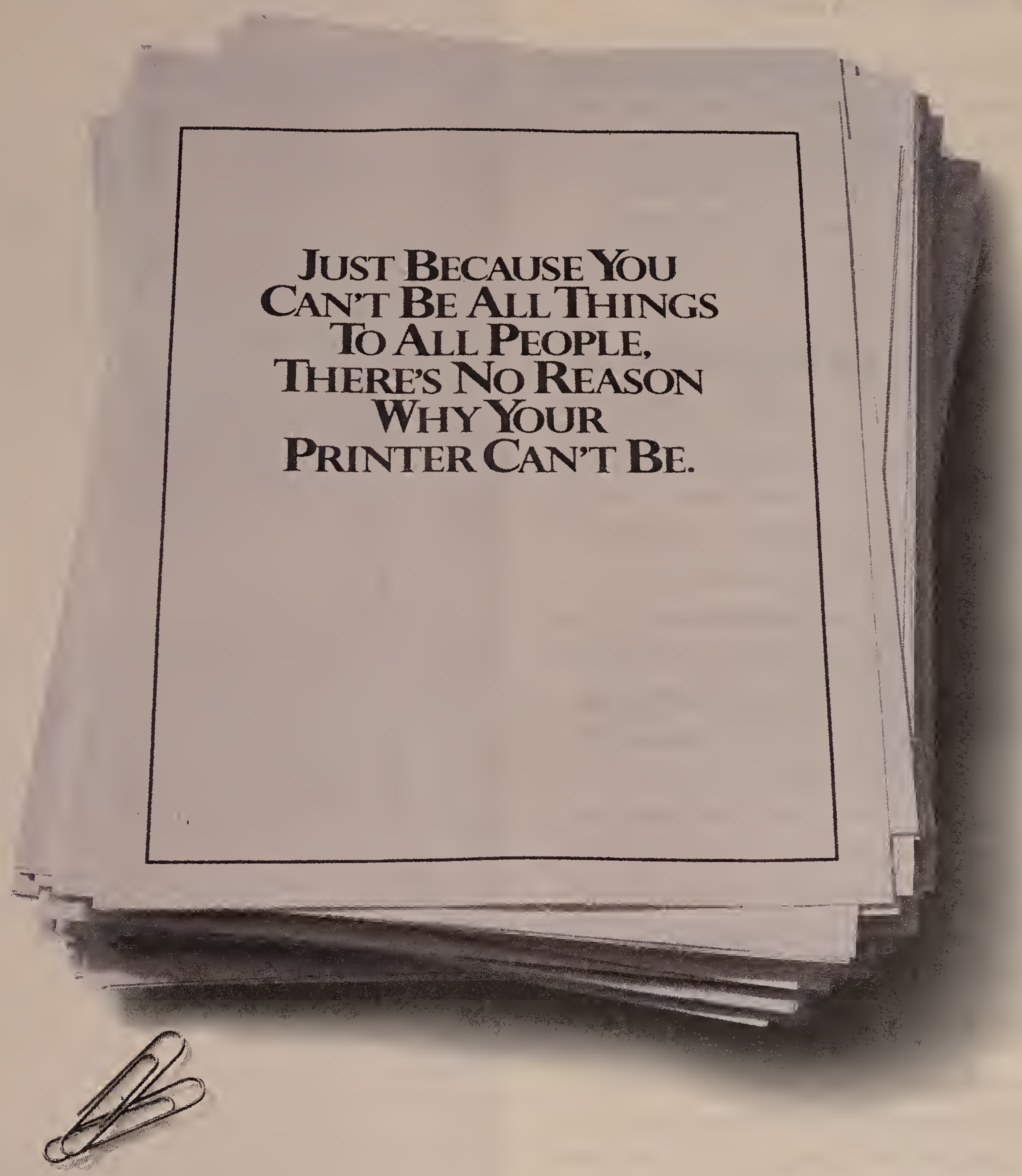

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(continued from page 43)

LAN interconnection over ATM, according to Michael DeMaio, supervisor of broadband systems engineering for AT&T Bell Laboratories.

The ATM Forum is developing the User-to-Network Interface, which will allow vendors and carriers to build equipment for linking public networks, private networks and customer premises equipment.

With this array of options from which to choose, it's no wonder users seem a bit perplexed when it comes to selecting a high-speed internetworking technology. However, analysts provide a simple piece of advice: Users looking to implement high-speed internetworking need to anticipate today what applications and traffic loads their networks will support in the next five years. With that information in hand, users can then pay careful attention to how the various technologies operate and how vendors and carriers intend to support them.

It won't be easy, but it will be worth the effort as traffic jams on internetwork links clear up and the ability to handle higher traffic loads becomes apparent. ◘

Don't overlook FDDI as option

Frame relay, Switched Multimegabit Data Services and Asynchronous Transfer Mode (ATM) may be grabbing all the attention today, but users should not overlook Fiber Distributed Data Interface as an internetworking option.

FDDI is suited for interconnecting local-area networks within a campus environment at 100M bit/sec. Users can either build a private backbone network or obtain an FDDI service from alternative carriers such as Metropolitan Fiber Systems, Inc.

"FDDI has been implemented in a lot of backbones already," says Michael Howard, president of Infonetics Research, Inc., a San Jose, Calif.-based market research firm. "It still has a place, especially if people need [high-bandwidth backbone nets] now."

FDDI is a token-passing network that uses two fiber-optic rings to achieve fault tolerance. Traffic circulates around the rings in opposite directions. One is a primary path; the other is a backup that can take over when the primary path fails.

FDDI includes a data link-layer protocol comparable to Ethernet and token ring, and, therefore, is compatible with existing applications and topologies. FDDI's principal advantage is its speed. At 100M bit/sec, it is ideal for backbone applications and can shuttle data between different LANs.

A major drawback is the need to buy and install fiber-optic cable as well as costly fiber interface boards for such network devices as concentrators. Until recently, workstations had to be linked to FDDI concentrators via fiber cable.

Now standards bodies are defining a specification for running FDDI over copper cable, which will enable users to link devices to FDDI concentrators over already installed coaxial, shielded or unshielded twisted-pair wire.

Even with the ability to run FDDI over copper cable, the concept of FDDI to the desktop is being adversely affected by the promise of ATM.

Even FDDI backbone applications could be limited by the advance of ATM. Vendors are promising to deliver ATM-based hub products later this year or early next year. These hubs would act as a switch to route traffic between devices attached to it.

FDDI's throughput of 20M to 30M bit/sec is no match for the expected 195M bit/sec throughput of ATM. This higher throughput makes ATM a better alternative technology than FDDI for supporting multimedia applications that mix text, voice and video on a workstation screen ("ATM threatens to usurp FDDI as backbone choice," *NW,* July 13).

"Unfortunately, the development of FDDI over copper has taken too long," Howard says. "The window is closing for that technology."

The ability for ATM to handle voice and video could put the brakes on development of FDDI-2, a proposal to expand FDDI to support transmission of voice and video. FDDI-2 defines a hybrid network combining packet traffic with circuit switched traffic. Supporting circuit switched traffic would allow FDDI-2 to handle voice and video and, thus, support multimedia applications. ◘

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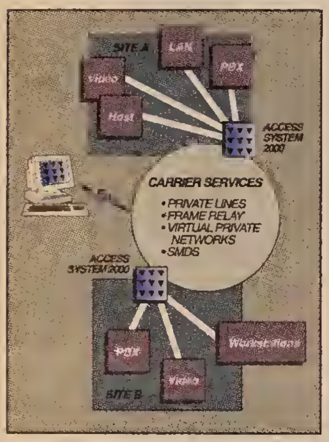

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Letters

continued from page 37

system calls back only preauthorized phone numbers, thus reducing the danger of hackers; automatic allocation of the network charges to the customer since the majority of the connect time is on the customer's outbound line rather than the provider's (if desired, the service provider can avoid this by providing toll-free access); and the ability to quickly and easily eliminate access for one service provider by disabling specific callback numbers and passwords.

Remote maintenance has become a fact of life for many businesses and can provide significant advantages. Simple precautions, such as auto dialback, can help to reduce the potential risks.

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Art of the language

Of the various suggestions in your article "User learns tough lesson in contracts" (*NW,* Aug. 3), those on contract language make it appear that it is simply a matter of wording.

Contract language almost always is the result of negotiation give-and-take. And getting to the point of agreement on language your company can live with is an art, one that vendors generally spend more time and energy perfecting than their customers do.

Typically, the customer's project manager and technical staff are concerned that the contract satisfies their technical terms of reference, and most have little experience or interest in negotiating contracts. Moreover, the customer's project manager almost invariably is convinced that the selected vendor and its product or service are not capable of error.

Therefore, what is the need for language that would protect the customer's business operations if the unthinkable happens? On the other hand, opposing lawyers hope to devise contract language that is deliberately ambiguous so they have room to maneuver in court.

In guiding their attorneys' contract negotiations, users' watchword should at all times be "caveat emptor."

Another point to consider: A vendor that would deliberately sabotage a customer's business operations over a payment dispute and whose president says that this is a common last-resort practice may well be a vendor that the industry can do without. Generally, litigation is the last resort between ethical businesspeople who disagree.

Could it be that the vendor thought its case was weak and would not prevail in court?

Thomas Lindsay
Managing director
Thomas Lindsay Associates
Melbourne, Fla.

Regulatory Update

continued from page 19

GHz frequencies pegged as optimum for PCS, the FCC, users and prospective PCS providers asked if the government could open the spectrum.

There was also hope among some microwave users — which are slated to be displaced or demoted to make room for the new technologies — that they could be moved to the slightly lower government frequency. Experts said such a move would be much simpler and less expensive than forcing microwave users to move to the 4-GHz, 6-GHz and 11-GHz bands.

The NTIA report said the government has invested $10 billion of taxpayers' money in equipment and services in the 1.71-GHz to 1.85-GHz band, which would be wasted if the frequency is given up for commercial uses. Additionally, the report said the government must have enough spectrum to accommodate future use.

Despite its reluctance to turn over the spectrum entirely to new technologies, the NTIA went on to say there might be enough unused spectrum in many parts of the country to support a limited number of microwave users whose networks will not operate reliably in the higher frequencies where they are targeted to be relocated.

An NTIA analysis concluded that of the top 50 metropolitan areas, 10 cities have spare spectrum now. The largest of those cities is Cleveland, which could accommodate 17 new assignments in the combined government and commercial bands of 1.71-GHz to 2.2-GHz without interference. The smallest of the top 50 areas with spare spectrum is Dayton/Springfield, Ohio. It has 47 spare frequency assignments.

Although this may be good news for some microwave users, it probably will not help the bulk of customers with relocation. The top 12 metropolitan areas could not accommodate new microwave users. ◘

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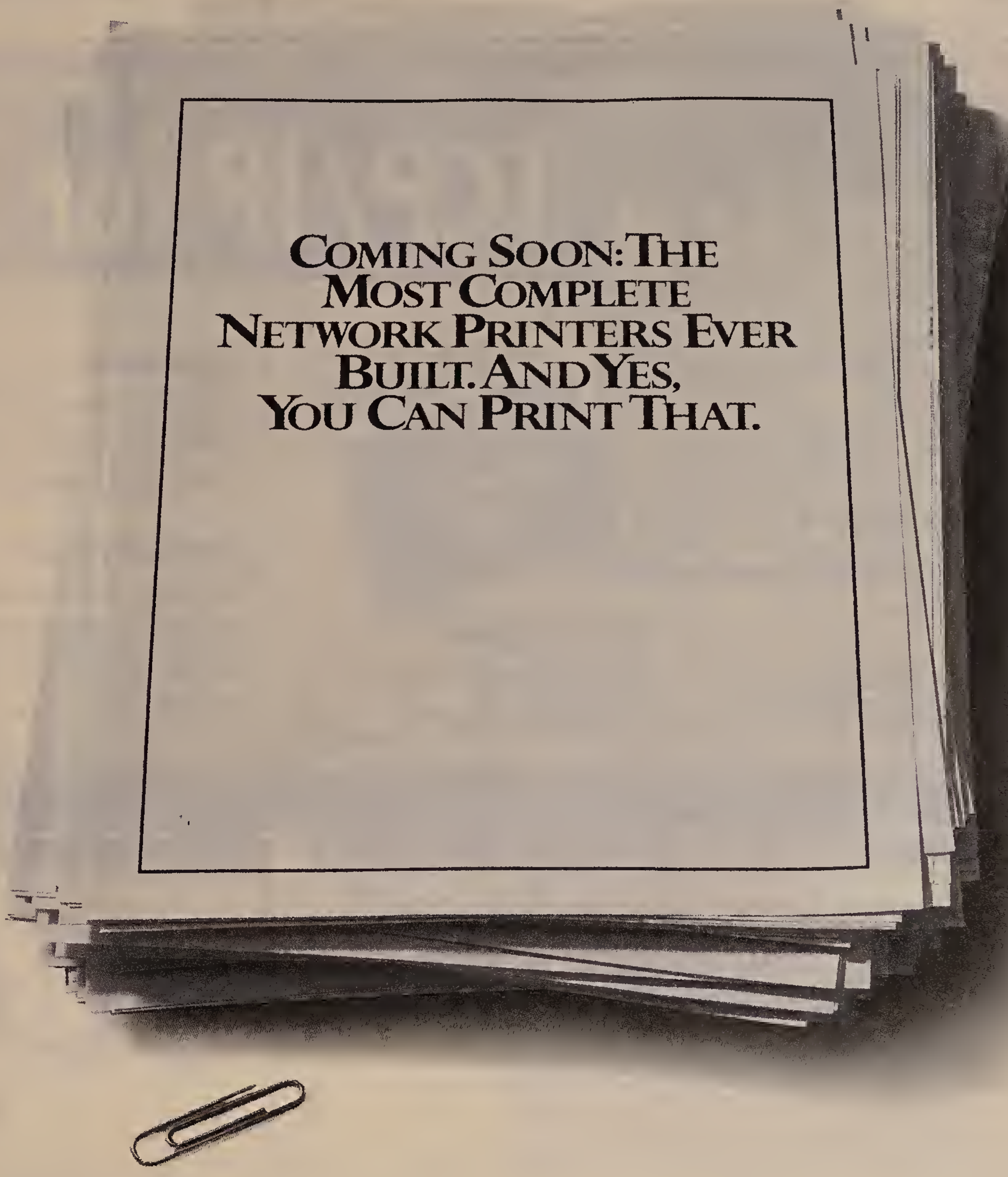
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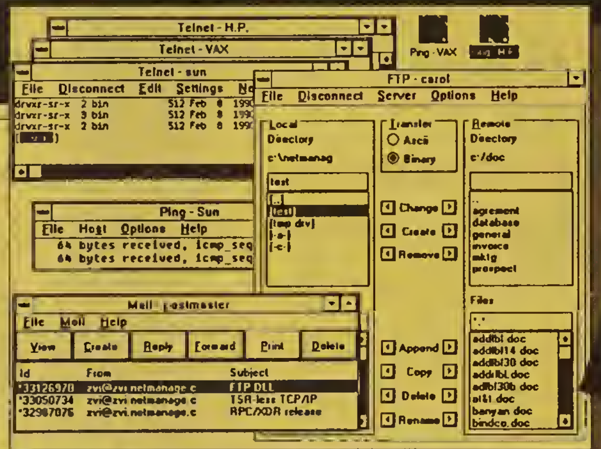

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drvxr-sr-x  3 bin        512 Feb  8  1990
drvxr-sr-x  2 bin        512 Feb  8  1990
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test
[..]
[test]
[tmp drv]
[-a-]
[-c-]

c:/doc
..
agrement
database
general
invoice
mktg
prospect

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addtbl doc
addtbl14 doc
addtbl30 doc
addtblL doc
adtbl30b doc
at&t doc
banyan doc
bindco. doc

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64 bytes received, icmp_seq
64 bytes received, icmp_seq
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Id	From	Subject
*33126970	zvi@zvi.netmanage.c	FTP DLL
*33050734	zvi@zvi.netmanage.c	TSR-less TCP/IP
*32987076	zvi@zvi.netmanage.c	RPC/XDR release

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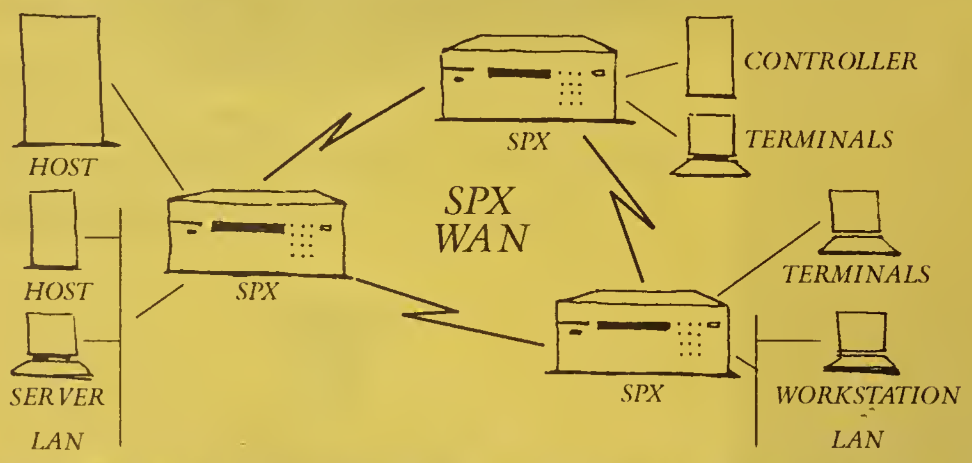

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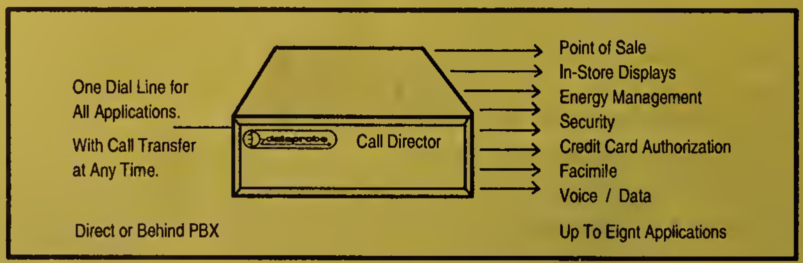

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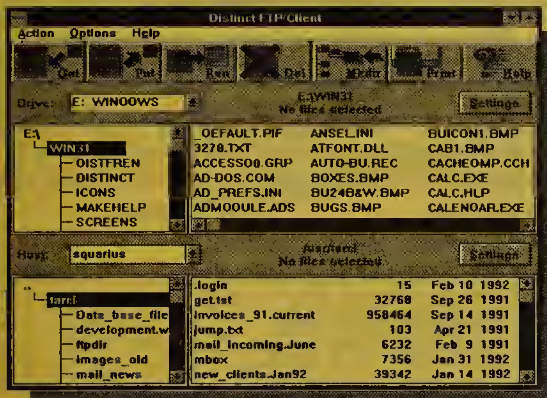

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E:\
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   ├DISTFREN
   ├DISTINCT
   ├ICONS
   ├MAKEHELP
   └SCREENS

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3270.TXT         ATFONT.DLL      CAB1.BMP
ACCESS00.GRP     AUTO-BU.REC     CACHEOMP.CCH
AD-DOS.COM       BOXES.BMP       CALC.EXE
AD_PREFS.INI     BU24B&W.BMP     CALC.HLP
ADMODULE.ADS     BUGS.BMP        CALENDAR.EXE

..
 └tarci
   ├Data_base_file
   ├development.w
   ├ftpdir
   ├images_old
   └mail_news

.login                   15   Feb 10 1992
get.tst               32768   Sep 26 1991
invoices_91.current  958464   Sep 14 1991
jump.txt                103   Apr 21 1991
mail_incoming.June     6232   Feb  9 1991
mbox                   7356   Jan 31 1992
new_clients.Jan92     39342   Jan 14 1992
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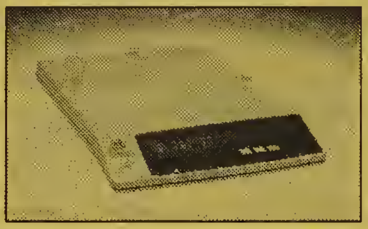

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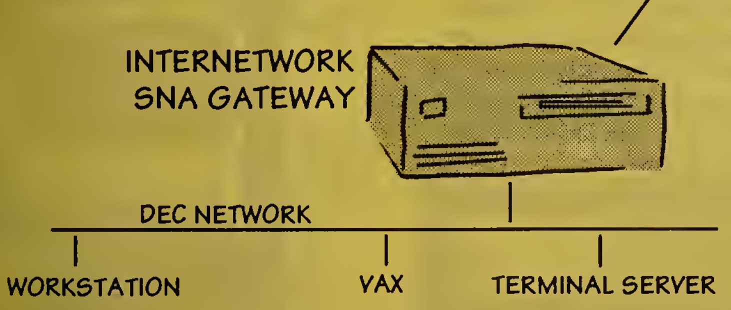

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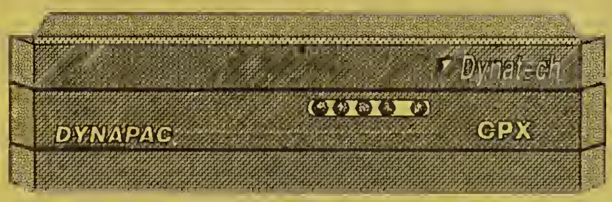

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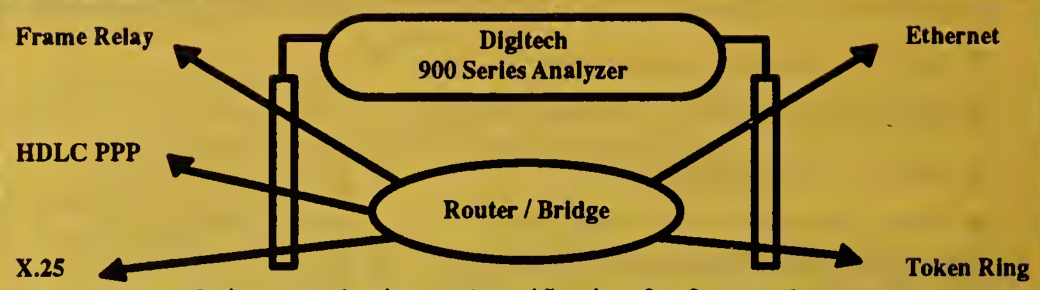

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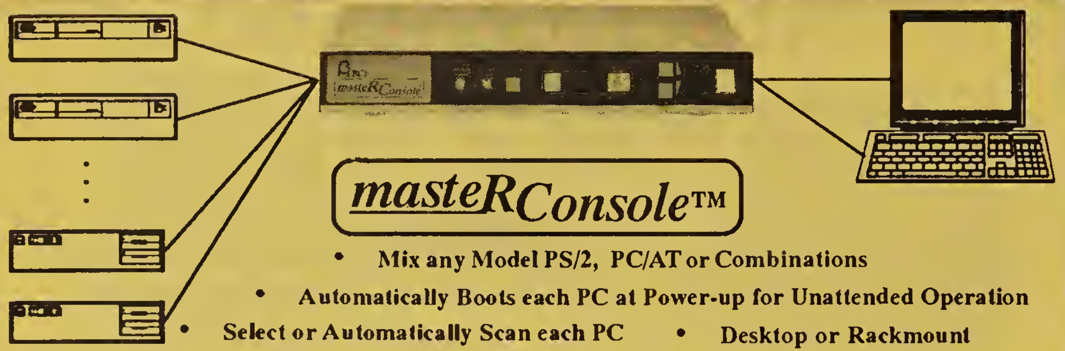

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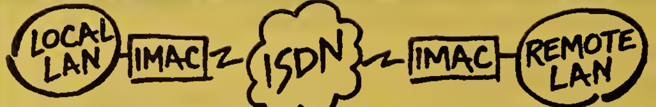

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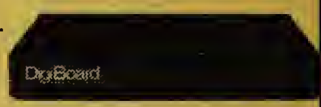

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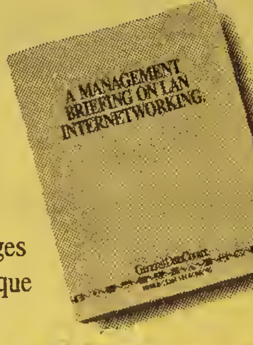

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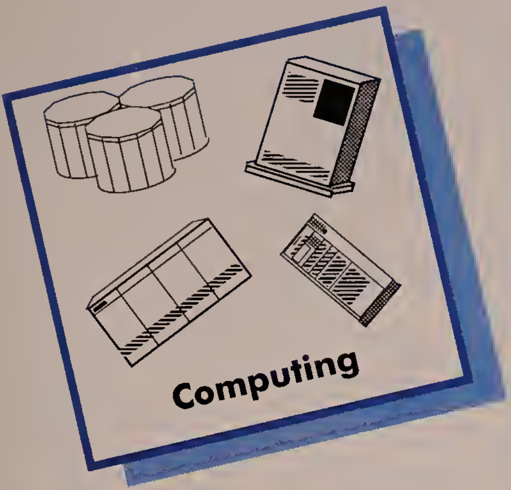

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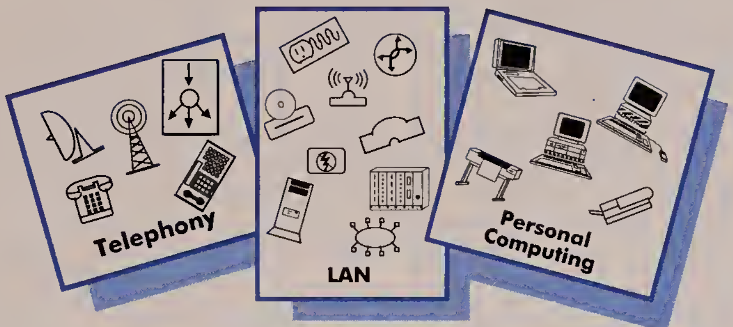

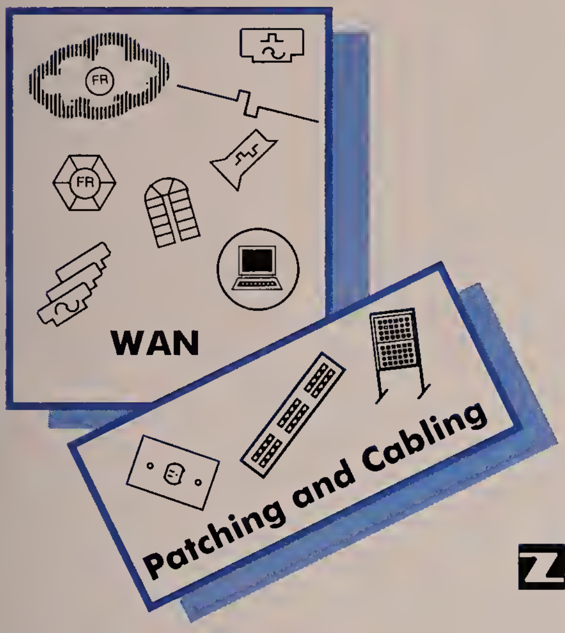

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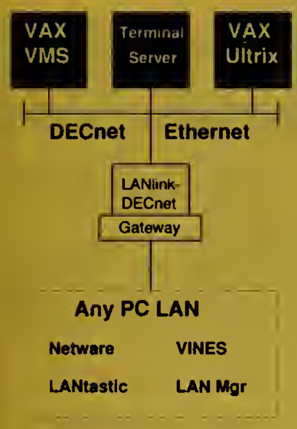

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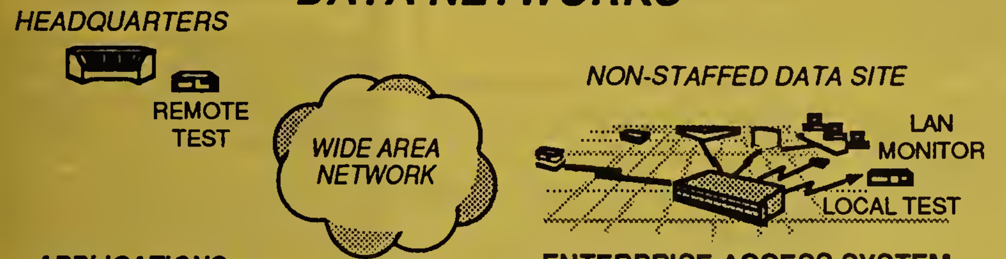

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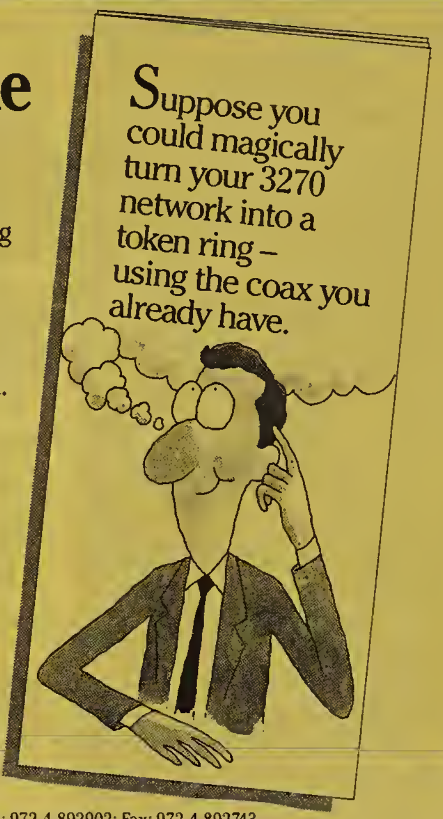
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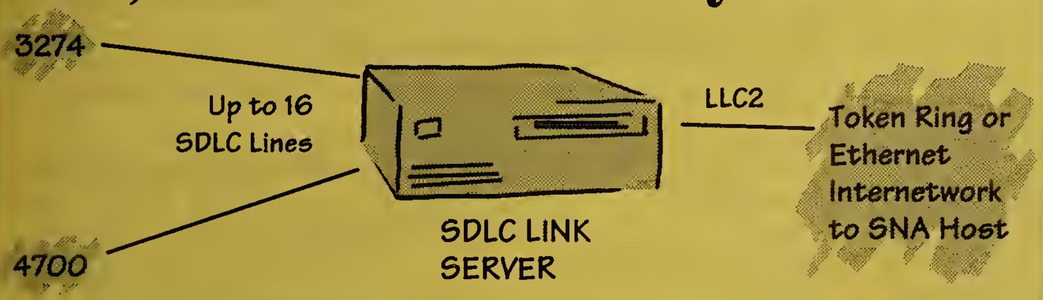

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By Paul Longoria

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IBM, Sears take on the world

continued from page 1

The Advantis network will combine IBM's and Sears' high-speed Systems Network Architecture backbones and support leased-line access at speeds up to T-1 and dial access at speeds of 300 to 19.2K bit/sec. Access to the net will be available from 550 cities in 92 countries worldwide, either directly or through Advantis affiliates.

Advantis will offer, among other services, SNA, X.25, Transmission Control Protocol/Internet Protocol, Advanced Peer-to-Peer Network and limited Integrated Services Digital Network transport services, and a range of messaging and EDI services.

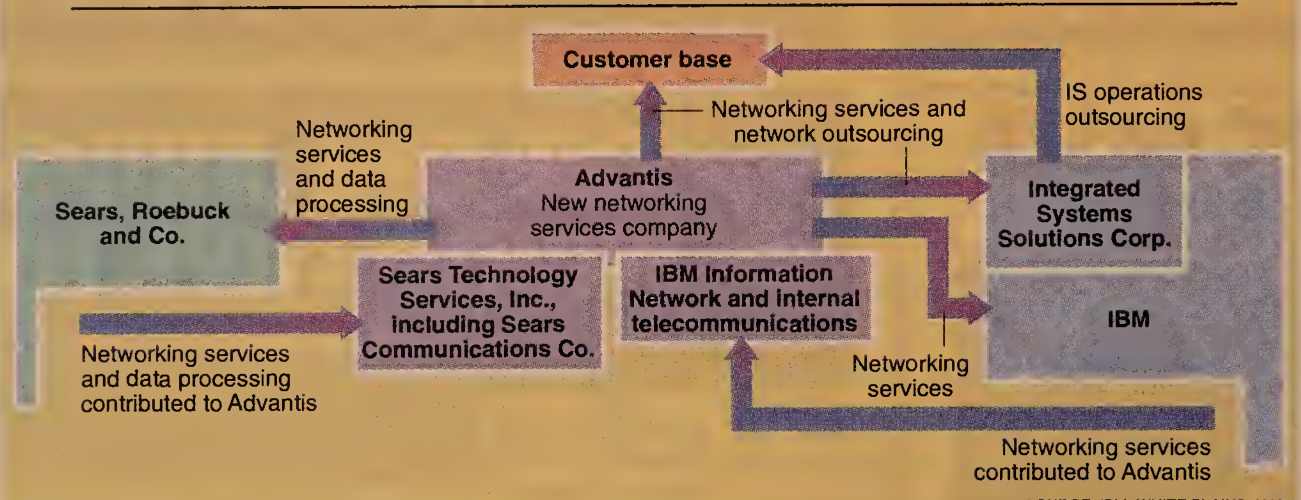
It will handle data processing chores through six domestic data centers and have some 3,000 employees. Along with transmission and DP, Advantis will offer custom net design, development and management services under its Private Managed Network services.

While Advantis will carry voice traffic, the company will not really be competing against telephone companies.

The majority of Advantis will be owned by IBM and will be run by Integrated Systems Solutions Corp., IBM's systems integration arm. Sears Technology Services, Inc. (STS), Sears Communications Co. (SCC) and IBM's Information Network (IIN) and internal Networking Systems Services will all be folded into Advantis.

STS handled network and DP services for Sears and its business units, while SCC sold net services outside the company.

IBM and Sears, Roebuck team to form network services firm



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GRAPHIC BY SUSAN SLATER

SOURCE: IBM, WHITE PLAINS, N.Y.

Advantis will be based in Schaumburg, Ill., and will have a board of directors made up of IBM and Sears executives.

Industry reaction to the creation of Advantis was generally favorable. Experts agreed that the new venture makes a lot of sense for both companies and said it should help IBM expand service and outsourcing revenues and enable Sears to gracefully exit an unprofitable business.

In addition, Sears will drop a major cost center by handing over its internal information systems to Advantis. "It removes one cost from Sears and turns it into an asset," said Howard Anderson, managing director of The Yankee Group, a consultancy in Boston. "Sears gets to take 1,500 employees and put them on Advantis' payroll."

Anderson said Advantis will primarily compete against BT and Sprint in the global net outsourcing market. He added that Advantis benefits from the reputation for excellence that both Sears and IBM have built up over the years.

That point was echoed by Cynthia Moore, an associate director with the Dataquest/Ledgeway Group, a consultancy in Lexington, Mass. "Both companies are experienced in the network operations field and together should be able to deliver a quality product," she said.

According to Anderson, STS had great technology and service but not the marketing expertise that IBM brings to the table. IBM will benefit from Sears' experience in the retail and financial services markets.

User view

IIN users expressed cautious optimism about the deal.

"The merger should be good news, but any time two companies of this size are pushed together, anything can happen," said Mike Fell, senior vice-president of First Data Corp., a cable television services vendor in Englewood, Calif. The company uses IBM's IIN services to support a billing application.

"It's very hard for two companies to keep a crystal clear focus on the customer as they merge their company philosophies," Fell said. "I think they'll ultimately succeed, but they have to move cautiously."

Fell said he hoped the merger would create additional services, such as increased EDI offerings, that First Data and its customers could use. "Improving the VAN service lets us improve service to our customers, as well," he said.

Other users said the union was long overdue.

"We tried several years ago to get them to interconnect their [SNA networks], and they had discussions but nothing came of it," said Bob Barham, president of the Insurance Value-Added Network Service (IVANS), a nationwide network that links agents to insurance companies. IVANS runs most of its network traffic across IBM's and Sears' SNA nets.

"It would be advantageous if our customers only had to deal with one network," Barham said.

Senior Editor Wayne Eckerson contributed to this story.

Muxes get frame relay tools

continued from page 1

lay Exchange (FRX) software for NET's IDNX backbone multiplexers and FrameLink software for its SPX statistical muxes. FRX allows IDNX users to establish a frame relay backbone that can be accessed from remote SPX muxes running FrameLink. FrameLink and FRX also support links to public frame relay services.

FRX is downloaded to NET's Packet Exchange (PX) packet switching modules, which each support eight ports ranging in speed from 16K to 3M bit/sec. Up to 16 PXs can be installed in an IDNX for a total of 128 frame relay ports.

FRX can handle IBM 3745 frame sizes of 4K bytes, which is said to increase throughput by reducing frame fragmentation and reassembly on the front-end processors. It also supports an IBM option that ensures priority delivery of critical SNA net control information.

The software allows users to burst data from IDNXs above the committed information rate for an indefinite period of time, provided bandwidth is available. FRX software can also detect impending network congestion by monitoring its buffer space and frames queued for transmission. It can then alert other devices and initiate congestion avoidance procedures, such as curtailing transmission, NET said.

SPX FrameLink allows SPX users to send traffic, such as LAN-to-LAN or terminal-to-host traffic, to IDNXs over 64K or 128K bit/sec frame relay circuits. The SPX supports 72 ports for asynchronous and synchronous devices and an optional Ethernet interface. On the network side, it supports up to four frame relay trunks and 32 virtual circuits per trunk, for a total of 128.

The congestion control features of both FrameLink and FRX are comprehensive, said Rick Malone, principal of Vertical Systems Group, a Dedham, Mass., T-1 market research firm. He said both feature congestion balancing, whereby every device shares in traffic off-loading, not just the most recent user.

In addition to its frame relay announcements, NET introduced software for the LWX, dubbed LWX 1.02, that supports a new protocol for sharing information among interconnected Token-Rings. The Remote Source Routing Fast protocol is optimized for routing IBM Source Route Bridging (SRB) traffic between Token-Rings.

In order to carry SRB traffic over a Transmission Control Protocol/Internet Protocol backbone, the data must be encapsulated in TCP/IP packets, a process that degrades performance and consumes bandwidth.

Encapsulating SRB in Remote Source Routing First is better, NET said, because it reduces protocol processing and improves bandwidth efficiency.

LWX 1.02 also adds support for Banyan Systems, Inc. VINES, Digital Equipment Corp. DECnet/OSI, X.25 and frame relay traffic. And it supports the Point-to-Point Protocol (PPP) in DECnet, Apple Computer, Inc. AppleTalk, Novell, Inc. Internetwork Packet Exchange (IPX) and Xerox Corp. Xerox Network Systems (XNS) protocols, in addition to the previously supported Internet Protocol.

PPP allows routers to interoperate over serial lines. In addition to IP traffic, LWX users can now exchange data over serial lines with non-NET routers that support PPP in DECnet, AppleTalk, IPX and XNS.

The FRX is priced from $8,500 to $10,900 and will be available in the fall. An SPX with FrameLink starts at $3,350 and will be available next month. LWX 1.02 ranges in price from $8,595 to $18,395 and is available now.

RBHC tariffs offer insights

continued from page 1

other bandwidth intensive applications.

All three carriers will roll out SMDS in the largest cities in their regions and deploy it to other cities based on demand.

In a move hailed by analysts, the companies have based pricing on flat monthly charges rather than usage charges, which observers say is important because users generally do not know how much internetwork traffic they have and are, therefore, wary of usage-based pricing. The services also carry onetime installation fees, and optional features such as group addressing carry onetime and monthly charges.

The carriers say SMDS at 1.17M bit/sec can cost less than T-1 for users with as few as four sites in a mesh network and be far more economical for users with larger networks (see "SMDS priced to sell," page 53).

Although SMDS may prove economic, there is one major trade-off: None of the three have any immediate plans to offer any type of network management features or products. Analysts say net management is the Achilles' heel of SMDS.

Bell Atlantic

Bell Atlantic has been the most aggressive of the RBHCs in deploying SMDS, with general tariffs in place to offer the service in Philadelphia, Pittsburgh, northern New Jersey and in the Washington, D.C. local access and transport area, which covers the District of Columbia, northern Virginia and suburban Maryland.

In Virginia and Maryland, Bell Atlantic charges a $1,000 onetime installation charge per site and a $550 flat monthly charge per site for 1.17M bit/sec SMDS. In Pennsylvania and New Jersey, users pay a $600 monthly rate. Users in Washington, D.C. pay a monthly fee of $650.

In all cases, the monthly charge includes one SMDS address. Additional addresses costs $5 a month, group addresses cost $50 each, and changing the address screen or group address membership costs $50.

Group addressing enables a net manager to send one command in order to set addresses for multiple stations on an SMDS network. Address screening is the ability to specify which devices can send and receive packets over SMDS.

Joe DiPeppe, SMDS product manager for Bell Atlantic, said early users of the service are interested in higher speed SMDS. DiPeppe said the carrier is waiting to see what Siemens Stromberg-Carlson will charge to enhance its switch to support SMDS at 34M bit/sec before deciding if it will upgrade to higher speeds.

"We could start offering SMDS at 34 as early as mid-1993 if [the upgrade] enables us to sell it at a price that users are willing to pay," DiPeppe said. "We would start offering SMDS at 34 on an individual case basis."

US West

US West is taking a different tack on SMDS.

The RBHC, through its subsidiary US West Communications, Inc., will file a general tariff this week to offer SMDS at 1.17M and 4M bit/sec in Minneapolis and Denver, and plans to offer 10M bit/sec in early 1993, as well as 16M, 25M and 34M bit/sec in the second quarter of 1993. The company is offering the service using AT&T's Broadband Networking Switch-2000.

US West Communication separates the cost of the SMDS access links from the flat monthly per-site charge for the service. For example, a company that signs up for SMDS at 1.17M bit/sec pays a onetime $750 installation charge, $115 per month per site and $493 a month for the interoffice SMDS link.

The 4M bit/sec service carries a $750 installation charge, a $766 per month fee and $900 per month for the interoffice SMDS link.

For each central office connection, US West Communications also assesses all SMDS users $1 a month and a onetime $25 charge.

SMDS addresses have an initial $50 charge and cost $50 per month. Each group address list costs $75 up front and $50 to change. Address screening carries a onetime $15 charge.

Joe Zell, service development director for US West's Advanced Communications Services unit, said the RBHC plans to begin providing users service utilization reports early next year but would not say if the carrier will charge for them.

The rates are pending approval from state regulators.

Pacific Telesis

Pacific Telesis will establish several firsts when it begins offering SMDS in Los Angeles next month.

The carrier, through its operating company Pacific Bell, will be the first RBHC to offer SMDS at 34M bit/sec as well as the standard 1.17M bit/sec, the first to offer SMDS call detail reports and the first to discount SMDS rates.

Like US West, Pacific Bell breaks out access and interoffice charges separately. SMDS at 1.17M bit/sec carries a $4,800 installation fee, a fixed fee of $600 per month per site and a $162.50 per-line channel termination charge. At 34M bit/sec, the service costs $4,800 for installation and $6,000 per month.

Under a discount plan worked out with the California Public Utilities Commission, Pacific Bell can discount both monthly and onetime charges.

It can discount the 1.17M bit/sec monthly charge to $475 and the installation fee to $3,800, and reduce the installation charge for the 34M bit/sec service to $3,800 and the monthly fee to $5,720.

Companies that already have fiber to their serving central office will pay no access charge, and those that use Pacific Bell fiber will pay a tariffed T-3 access rate.

If the carrier installs fiber to the user, the cost of the special construction will be passed on to the customer.

In hopes of making SMDS easier to deal with, Pacific Bell will offer call detail information on compact discs for $15 a month. "It'll give users a count of how many packets are sent over SMDS from each location," said Steve Starliper, SMDS director for Pacific Bell. "Users will be able to see how many packets were transmitted in any 15-minute period."

Like US West Communications and Bell Atlantic, Pacific Bell will offer group addressing and address screening. Group addressing will cost $10 a month per customer, while address screening is included in the cost of SMDS.

The rates are pending approval by state regulators.

SMDS is priced to sell

Eager to cash in on the expanding high-speed data services market, Bell Atlantic Corp., US West Communications, Inc. and Pacific Bell have priced SMDS so that it is less expensive than T-1 for even small nets.

Rates for Switched Multimegabit Data Service at 1.17M bit/sec are lower than T-1 for a four-site, fully meshed intra-local access and transport area net.

By moving from T-1 to SMDS, users reduce the number of lines needed to carry data in a fully meshed network, which in turn halves the number of channel service units (CSU) needed. In a four-node network, for example, six circuits are needed. With SMDS, by contrast, only four links are needed.

Under Bell Atlantic's SMDS rates in Philadelphia — $600 a month per site for unlimited usage — users can save $1,296 a month by moving from a four-node T-1 network, in which each link is six miles long, to SMDS.

The same holds true for SMDS rates filed by US West Communications and Pacific Bell (see graphic).

All comparisons assume the SMDS links are used around the clock. The figures in the chart do not include installation charges for T-1 or SMDS access lines.

The reduction in the number of CSUs and router ports needed when a user moves from T-1 to SMDS are substantial. If a user moves from a four-site, fully meshed T-1 net to a four-site SMDS net, the number of CSUs and the number of router ports goes from 12 to four.

— *Bob Wallace*

SMDS vs. T-1

For a 4-site mesh network

T-1	Unit cost	Total	SMDS	Unit cost	Total
Bell Atlantic Corp.					
6 channels	$54	$324	4 access lines	$600	$2,400
12 terminations	$212	$2,544			
36 miles*	$23	$828			
Total		$3,696	Total		$2,400
US West Communications, Inc.					
	Unit cost	Total		Unit cost	Total
6 channels	$150	$900	4 access lines	$115	$460
12 terminations	$150	$1,800	4 interoffice channels	$493	$1,972
36 miles*	$11	$396			
Total		$3,096	Total		$2,432
Pacific Bell					
	Unit cost	Total		Unit cost	Total
6 channels	$175	$1,050	4 access lines	$600	$2,400
12 terminations	$162.50	$1,950	4 interoffice channels	$162.50	$650
36 miles*	$21	$756			
Total		$3,756	Total		$3,050

*Assumes a 6-mile link

SMDS = Switched Multimegabit Data Service

GRAPHIC BY SUSAN SLATER

SOURCE: *NETWORK WORLD*

MAI to offer financial pack

continued from page 4

PeopleSoft financial software will only run on Microsoft Windows clients. However, PeopleSoft software provides much greater flexibility on the back end than MAI Financial Solutions. PeopleSoft will connect to a variety of SQL databases running on mainframe, mid-range or local-area network servers.

MAI Financial Solutions consists of four modules — Accounts Payable, General Ledger, Accounts Receivable and Fixed Assets — that can either work together or independently.

The General Ledger and Accounts Payable modules are available now. The Accounts Receivable and Fixed Assets modules are scheduled to ship next year, Brickley said.

New market

Until now, MAI has focused on selling minicomputer-based financial software to smaller firms.

Peter Kastner, an analyst at Aberdeen Group, Inc., a market research and consulting firm in Boston, said MAI will need to develop a sales force capable of selling to large corporations, a task that will be difficult and costly. But Kastner was optimistic that MAI would find success.

Pricing for MAI Financial Solutions is based on the size of the server and number of users and begins at $40,000 per module.

Pan-European service in works

continued from page 2

European data network developed primarily to offer high-speed private lines ("European carriers unite in continental network effort," *NW*, July 13).

GEN operators and AT&T, which is building its own pan-European net ("AT&T storms Europe in data net offensive," *NW*, March 16), may eventually use the nets to support switched digital services.

The switched services on the new net will be based on a MegaNet central office switch from Diax Telecommunications A/S, a joint venture between LM Ericsson A/S and Bang & Olufsen A/S. Bang & Olufsen will provide customer premises equipment.

The services will enable users to dial up one, two, four, six, eight, 12, 23, 24 or 30 64K bit/sec channels to establish links for applications such as LAN interconnection, videoconferencing and disaster recovery.

Bang & Olufson is offering two pieces of customer premises equipment for use with the service: a terminal adapter-type device called the Dikonet 2000 and a dialer called the Dikonet 64. The Dikonet 64 will have a 2M bit/sec carrier net interface on one side and a V.35/RS-449 synchronous and a 2M bit/sec interface on the other.

When users want to establish a high-speed link, they will dial into the nearest MegaNet switch using the Dikonet 64 dialer and establish the 64K bit/sec traffic-carrying channels needed.

One drawback will be that the Bang & Olufson equipment will use a proprietary signaling method to communicate with the MegaNet switch. Eventually, all the equipment will be modified to use the CCITT's Q.931 signaling scheme so customers will be able to use other vendors' gear.

Ascend Communications, Inc. and Teleos Communications, Inc. plan to build products that work with the services but will wait for Q.931 support.

They said the products they plan to build will support multiple simultaneous applications and will be able to allocate bandwidth as needed.

Vitalink Communications Corp. said it already offers equipment based on the proprietary signaling specification to be used by the foreign carriers.

Although the service will provide an alternative to scarce international digital private lines, it will require use of dedicated 2.048M bit/sec E-1 access links, which cannot be used to support other PTT services, Christensen said.

Cisco airs FDDI card for routers

continued from page 4

The new FDDI module is designed for Cisco's high-end AGS+ bridge/router and is equipped with a 16-million-instructions-per-second processor with direct memory access and Advanced Micro Devices, Inc.'s Supernet chipset.

As many as four cards can be installed. Alternatively, one FDDI interface can be combined with up to 20 serial, 12 token-ring or 22 Ethernet interfaces.

The device has an aggregate throughput of 60K packet/sec, using 64-byte packets, and supports both single- and multimode FDDI. It is also equipped with a dual-station attachment and offers dual homing for redundancy and fault-tolerance.

The module is scheduled to be available in October and costs $16,500. Users of Cisco's earlier FDDI interface can upgrade to the new version for $5,000.

Novell deal to tighten ties

continued from page 5

Memorex Telex's Down Stream Physical Unit NLM will enable the gateway to be channel-attached to IBM hosts, obviating the need to access mainframes through a front-end processor (FEP). Channel-connection will improve speed and reliability compared to LAN gateways connected through a FEP.

Another NLM will support Memorex Telex's 1472/PC for SAA, a terminal emulator that offers NetView agents for PC clients, making the PCs that run the emulator visible to NetView.

The terminal emulation software, which sells separately, will also support IBM's Response Time Monitor, which lets NetView management stations gauge how quickly PCs are getting at mainframe resources. It also supports Extended Vital Product Data, which feeds inventory data to NetView or other programs that support the IBM standard. "For their customers, many that are strictly IBM users, supporting NetView down to the PC-level is important," said IDC's Santisario.

A third NLM will support IBM's TN 3270 standard, which allows terminal emulation over TCP/IP connections.

The 9430 Enterprise Gateway will offer a special high-speed interface to a new line of superservers that Memorex Telex last week announced it will develop with Minneapolis-based Tricord Systems.

The new Memorex Telex 8600 line of superservers will be jointly developed by the two companies and based on Tricord's PowerFrame multiprocessor technology, said Mary McVey, a spokeswoman for Memorex Telex.

Memorex Telex plans to ship the servers with the NetWare LAN operating system already installed, sources said. Neither company offered a price or shipment date for the servers.

Senior Editor Michael Cooney contributed to this report.

NREN award to vault Sprint

continued from page 1

years of the Energy Sciences Network (ESnet) Fast Packet Services contract (see graphic, page 1).

The contract initially calls for migrating the DOE's private research network, the T-1 ESnet, currently supplied by AT&T under the Federal Telecommunications System 2000, to a Sprint switched T-3 ATM service.

Sprint will have a year to develop the new T-3 ATM service and test it with users at the DOE and NASA's research facilities to evaluate local-area network interconnection and supercomputer data transfer.

But the award represents more than a government network upgrade; it is the DOE's contribution to NREN, the government-funded effort to build a national gigabit-speed network by 1996.

Although no comprehensive NREN design has been unveiled to date (see "Gov't struggles with NREN," this page), the DOE initiative signifies the first step toward establishing a gigabit-speed backbone network for the country. The DOE contract, funded under the High-Performance Computing and Communications Program, of which NREN is a part, calls for the chosen vendor to make the services available to the commercial sector, as well.

The DOE award also promises to carry Sprint's team partners — Cisco Systems, Inc., TRW, Inc. and Digital Equipment Corp. — on the ATM wave. Sprint is calling on Cisco to deliver ATM routers, while DEC will provide software based on its Enterprise Management Architecture to manage the network's ATM devices.

Sprint wants to use a modified version of the TRW Space Communications Division Broadband Access Switch 2010 line of ATM switches, developed under a Department of Defense program, for both LAN and backbone wide-area network applications.

The TRW switches are not commercially available yet, but TRW expects to deliver four prototype T-3 ATM switches by year end. Upon acceptance, TRW will begin production of seven operational switches.

Jim Leighton, manager of networking and distributed computing at Lawrence Livermore's National Energy Research and Supercomputing Center, said Sprint beat out its rivals in the contract bidding by presenting the clearest and most comprehensive technical proposal.

"Price was not a consideration," Leighton said. "We had the clear impression they had the best understanding of the technology, and they seemed to understand what our requirements were." Both AT&T and MCI Communications Corp. — the losing bidders in the contest — said they are leaving their options open to protest the award.

It was expected that the DOE would settle on Switched Multimegabit Data Service (SMDS) for T-3 service, but Sprint convinced the department to take another course.

"We proposed that [the DOE] not buy SMDS and have to figure out how to make it work," said Dale Williams, assistant vice-president of product marketing for Sprint's Government Systems Division. "We proposed they immediately go to ATM."

Williams said T-3 ATM can be accommodated on Sprint's current T-3 backbone.

Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy, said ATM and SMDS are similar but ATM is connection-oriented while SMDS is connectionless. Network planning is generally easier with connection-oriented services, he said.

"Rather than get into the SMDS jungle, they decided to go directly to ATM," said Mike Roberts, vice-president of EDUCOM, an academic interest group.

Williams said Sprint is not under the illusion that its job will be easy. He pointed out that ATM standards are still evolving. "An Internet Protocol-to-ATM interface protocol hasn't been finalized yet," he said. "We quite honestly expect to run into problems."

Gov't struggles with NREN

The government's intent to establish a gigabit-speed National Research and Education Network (NREN) remains one of the most confusing — and intriguing — topics in high-technology circles.

The U.S. government has never unveiled a comprehensive plan for NREN, though it doled out millions of dollars last year for the project under the High-Performance Computing and Communications Program.

Rather, NREN is slowly taking shape as the somewhat disconnected — although not contradictory — efforts of the federal agencies funded to provide it move forward with their respective network plans. The agencies are the Department of Energy (DOE), National Aeronautics and Space Administration, National Science Foundation and Defense Advanced Research Projects Agency.

The lack of NREN definition has its roots in an uneasy truce between Congress — led by Sen. Albert Gore (D-Tenn.) who pushed for an NREN financed with taxpayers' money — and the Bush administration, leery of government intervention in the network business. Both can claim to have won the argument through artful compromise, but the vagueness in last year's legislation has spared both sides more hostile encounters and colored discussion of the subject ever since.

"NREN is probably the program, not the network," conceded Jim Leighton, manager of networking and distributed computing at Lawrence Livermore's National Energy Research and Supercomputing Center. The agencies meet to discuss their NREN plans but have shaped no encompassing plan for the program other than general support for Asynchronous Transfer Mode (ATM) as an underlying technology.

However, the DOE's new contract brings clarity to the direction of gigabit networking and represents a giant step forward in boosting ATM technology (see "First NREN award will vault Sprint to forefront of ATM," page 1).

— *Ellen Messmer*

NETWORK WORLD

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161 Worcester Road
Framingham, Mass. 01701-9172
(508) 875-6400

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Network Innovators

Scott Weikart

A founder of the Institute for Global Communications, Weikart brings networking tools to nonprofit organizations around the world.

By Jerry Lazar

A decade ago, Scott Weikart was designing proprietary local- and wide-area network architectures for Hewlett-Packard Co. He was being paid good money, but he wasn't very happy.

"I felt alienated working in HP labs," says Weikart, whose liberal political views clashed with those of his more button-down coworkers. "I'd get in big arguments over [social issues] that would seem obvious to me."

Today, Weikart, 41, is a cofounder of and a consultant with the Institute for Global Communications (IGC), a San Francisco-based nonprofit organization that provides networking tools for international information exchange.

And while Weikart is making considerably less money, he's much happier.

"In leaving HP, I got my work life and values more in line," says Weikart, an activist since his undergraduate days at the University of Illinois.

In an era when "being [politically] left may mean [being] left out," Weikart is bucking a trend. IGC manages computer-mediated communications systems PeaceNet, EcoNet and ConflictNet. Each of these enhanced bulletin board systems (BBS), he says, helps advance a progressive agenda.

PeaceNet, founded in 1986, concentrates on peace and social justice issues throughout the world. EcoNet, which was launched in its current incarnation in 1988, provides information and services for individuals and organizations working for environmental preservation and sustainability. ConflictNet, founded in 1990, serves groups and individuals working for conflict resolution.

IGC's guiding principle is "the vision of creating a tool that people can use to improve the world — a tool that people might not otherwise have in social movements," says Steven Fram, IGC's technical director.

All three BBSs reside in IGC's San Francisco office on a single Sun Microsystems, Inc. SPARCstation II running under SunOS 4.1.1, a version of Unix. The hardware features 64M bytes of random-access memory and 4G bytes of storage. It uses a Unix version of Notes File, which is computer conferencing software originally developed at the University of Illinois in the 1970s. Notes File allows more than 100 users to access the BBSs simultaneously.

Using Notes File, however, puts IGC out on a technological limb. Although Control Data Corp. briefly tried to market it, Notes File "hasn't been heavily supported," Weikart acknowledges. "But it's more important for us to have functional software than to have software that most people are using."

The three BBSs' 6,000 users in 84 countries connect to the host via direct dial-up connections. They also gain access through a number of X.25 public packet switched networks, including Telenet and SprintNet.

Subscribers pay a onetime sign-up fee of $15 and a $10 monthly fee. Within the U.S., connection time costs $10 per hour during peak time (Monday through Friday, 7 a.m. to 6 p.m.) and $5 per off-peak hour.

Users can participate in several hundred public forums on topics including global warming, human rights, disarmament and environmental education. Services include access to alternative news services, including newsletters from all over the world, as well as electronic mail, fax and telex capabilities.

The typical user, according to Weikart, may be a staff member of a nonprofit or government group or a committed volunteer working for a local peace or environmental group.

"We don't really market to corporations," Fram says. At least one oil company, however, uses it to check the pulse of the environmental movement.

As a nonprofit entity, IGC is truly computing on a shoestring. The company depends on donations and user fees to keep going.

Nevertheless, not only have Weikart and IGC been able to create and maintain a national nonprofit network environment, they have also succeeded in an area where many commercial ventures fail: They've established an international networking presence.

IGC is at the hub of the Association for Progressive Communications (APC), a worldwide federation of 10 networked BBSs providing similar services in countries such as Australia, Germany, Nicaragua and Russia. These BBSs, each running on a Reduced Instruction Set Computing- or 80386-based computer, interchange as much as 1M byte of data per day.

According to Weikart, the 10 APC BBSs communicate using three options. "We may use international phone calls with high-speed Telebit Corp. modems, call an X.25 packet assembler/disassembler or communicate over the Internet," he says.

Using these options, IGC ensures that all new information on each APC BBS is propagated to the other host BBSs between three and 24 times per day.

Weikart learned about computer conferencing at the University of Illinois. There, he worked on Plato, an early networked educational system that ran courseware accessible by students around the country. "That was the model I used for the computer conferencing on PeaceNet," Weikart says.

After college, Weikart took a job at HP, but he was never really comfortable being the office socialist.

His after-hours work, however, was another matter. "I was allowed to let volunteer-based nonprofits use the computers after hours," he says. These included women's groups, gay rights organizations and others.

"I found there was a great need among nonprofit organizations [for a data communications tool]," he adds. "When Unix became available on microcomputers, I saw the real opportunity to provide sophisticated computing to nonprofit organizations."

> **IGC's guiding principle is "the vision of creating a tool that people can use to improve the world."**

The direct result of that realization was Community Data Processing (CDP), a nonprofit consultancy founded by 10 technical professionals, including Weikart. In 1986, CDP and two other nonprofit organizations established IGC to manage the EcoNet and PeaceNet.

Armed with its first computer (a Motorola, Inc. 68000 machine) and communications software, IGC began its mission: to recruit both information providers and users.

"We looked for groups doing progressive work and asked them, 'Could you use E-mail, conferencing or better communications?' " Weikart says.

IGC grew naturally from a local to a national to an international presence, Weikart recalls. "The outreach for PeaceNet was in the U.S., but from the very beginning, we had people logging on from around the world," he says.

Through the activities of PeaceNet, IGC encountered the operators of GreenNet, an environmentally oriented user network based in England. "They borrowed a computer like the one we were using for PeaceNet," Weikart says. "So I said, 'Why don't we give you our software?' "

The next thing Weikart knew, he was flying to London with a controller card, magnetic tapes and a user manual. Within a week, the PeaceNet and GreenNet hosts were communicating. "It was so easy because we based it on Unix," he says. "We had Unix-to-Unix Copy Program and UUCP Mail and Notes File; that was about it."

IGC's overseas affiliates are typically nonprofit organizations. "They're people who've worked in the activist community," Weikart explains. The end result is exactly what multinational companies look for in their overseas subsidiaries.

In some ways, IGC resembles an entrepreneurial start-up industry. "We certainly pay ourselves like start-ups," Weikart says with a laugh, "only without the stock options."

But the level of commitment to IGC does resemble a new technology company — or a volunteer organization.

"There's a level of scrounging here," he says. "There's the philosophy of making do."

The resulting system may not be pretty, but it does the job. And the job is one that needs doing.

"The real reason Scott wants to be where he is is some form of idealism," says Tracy Larabee, one of Weikart's former HP colleagues, who is now professor of computer science at the University of California, Santa Cruz. "Some people move away from academia because they want to make money. Some move back because they want to make a difference. Scott needs to make a concrete difference — to affect what's going on in the world right now."

Lazar is a free-lance writer based in Cliffside Park, N.J.

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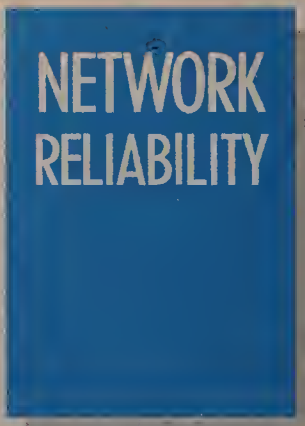

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